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Evaluation of the Expanded EBT Demonstration in Maryland

Patterns of Food Stamp and Cash Welfare Benefit Redemption

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EXECUTIVE SUMMARY

This report presents a description of the benefit redemption behavior of food stamp and cash assistance clients participating in the statewide electronic benefit transfer (EBT) demonstration in Maryland. The research is based on the redemption activity of approximately 130,000 food stamp recipients and 75,000 recipients of cash assistance during September 1993, following full implementation of Maryland's EBT system.¹ The main findings of the research are summarized below.

Food Stamp Recipients Use the EBT System Frequently

- Food stamp recipients average a bit over ten EBT transactions a month. The average is even higher in Baltimore City (nearly 13 transactions per month, versus fewer than eight transactions per month in both metro and non-metro counties).²
- The average number of transactions per case increases with allotment size, but at a decreasing rate.
- Non-public assistance (NPA) food stamp cases use the system considerably less frequently than public assistance (PA) food stamp cases, but this is due to differences in average monthly benefits.

Food Stamp Recipients Use Their Benefits Very Quickly

- Statewide, nearly 23 percent of all monthly benefits are spent the day they are disbursed. In Baltimore City, over 25 percent of benefits are spent immediately, *versus* about 20 percent in both metro and non-metro counties.
- Statewide, about 71 percent of food stamp benefits are redeemed within one week of disbursement (76 percent in Baltimore City *versus* about 66 percent elsewhere in the state).

1. EBT was fully implemented statewide in July 1993.

2. "Metro" counties are those within the borders of Standard Metropolitan Statistical Areas (SMSAs), excluding Baltimore City; "non-metro" counties are all other counties.

- Average purchase amounts fall dramatically over the first week, and then tend to level off until the end of the month. This is true in all store types except convenience stores. Average purchase amounts in convenience stores are relatively constant throughout the month.
- The speed at which food stamp benefits are redeemed is nearly the same regardless of the size of the recipient's allotment. To the extent a difference exists, it appears that recipients with small monthly allotments are more likely to retain benefits at the end of the month.
- Nearly 80 percent of all food stamp recipients *completely* exhaust their benefits by the end of the month. Less than 5 percent of recipients have more than 5 percent of benefits remaining at the end of the month.
- For the recipients who do not exhaust their benefits, the average amount carried over to the next month is \$24.

Most Food Stamp Benefits are Redeemed at Supermarkets

- Seventy-two percent of all food stamp benefits in Maryland are spent at supermarkets, even though supermarkets represent only 17 percent of program-authorized stores in the state.
- Even in Baltimore City, where supermarkets represent only 6 percent of authorized stores, recipients spend 61 percent of their benefits at supermarkets.
- The average value of a purchase in a supermarket is \$48, *versus* \$21 in specialty stores (the store type having the next highest average purchase amount).
- On any given day of the month, supermarkets' percentage of total daily food stamp redemptions throughout the state is roughly constant. The same is true for the other store types. Thus, there is no evidence that recipients make their big purchases at the beginning of the month in supermarkets and then, during the rest of the month, make smaller-value purchases at other store types.

Cash Assistance Benefits are Accessed Even More Rapidly Than Food Stamp Benefits

- Cash benefit recipients average 4.6 withdrawal transactions per month, or 1.7 transactions per \$100 in benefits.

- Over 60 percent of all cash benefits are redeemed on the day of disbursement; 91 percent are redeemed by the end of the first week.
- Baltimore City recipients access their cash benefits more rapidly than recipients in other parts of the state.

POS Terminals Are an Important Source of Access to Cash Program Funds

- Forty-seven percent of all cash program transactions (representing 27 percent of total benefits accessed) are conducted at POS terminals. (The data do not allow one to distinguish between cash withdrawals at POS and regular purchases using EBT benefits.)
- POS terminals are an even more important point of access in Baltimore City where, depending on program, 55 to 61 percent of all transactions (representing 33 to 45 percent of cash benefits redeemed) occur at POS terminals.
- Most cash program recipients use both ATMs and POS terminals to access their benefits. Statewide, only 16 percent of cases use ATMs exclusively, and only 20 percent use POS terminals exclusively.
- In general, the relative use of ATMs increases as their relative availability increases. A small number of recipients use out-of-state ATMs.
- Statewide, the average ATM withdrawal is about \$114. The average POS withdrawal/purchase is about \$53.
- Twenty-four percent of cash assistance cases had benefits remaining in their EBT accounts at the end of the month; the average balance for this group was \$35.

CHAPTER ONE

INTRODUCTION AND DESCRIPTION OF DATA

The purpose of the Food Stamp Program (FSP) is "to permit low-income households to obtain a more nutritious diet through normal channels of trade".³ Yet prior to the EBT demonstrations, information about *where* recipients redeem their benefits could only be tracked by aggregate statistics showing the volume of redemptions at each type of program-authorized retailer, or from small-sample surveys of individual recipients. Hence, it was not possible to examine the general patterns of benefit redemption—such as the types of stores accessed, the frequency of shopping trips, and the timing of benefit exhaustion—on a large scale at the micro level.

With the introduction of electronic benefit transfer (EBT) systems for benefit disbursement, detailed information becomes available about food stamp benefit redemption. For example, instead of simply finding that 80 percent of all food stamp coupons are redeemed at supermarkets, we can now examine how that figure varies across subgroups of the caseload, how it varies by geographic area holding casemix constant, and how it depends on the number and types of retailers in an area. This is because, in an EBT system, every purchase transaction is electronically recorded within a central processing system. Hence, detailed information is available at the case level and without the measurement error inherent in survey data.

This report examines benefit redemption data from the statewide EBT demonstration in Maryland. EBT was fully implemented in Maryland by July 1993, to serve both the food stamp population and recipients of cash benefit transfers (Aid to Families with Dependent Children (AFDC) and Disability Assistance Loan Program (DALP)). The Maryland demonstration is not the first EBT demonstration, and indeed previous demonstrations have provided information about redemption patterns in the FSP.⁴ The Maryland demonstration, however, provides the first opportunity to analyze the redemption patterns of *both* the FSP caseload and the cash assistance caseload. In addition, the State of Maryland encompasses a large caseload of varied demographic

3. The Food Stamp Act of 1977 (7 U.S.C.).

4. See Bartlett, Susan and Meg Hart (1987) and Phoenix Planning and Evaluation (1993) for evidence from the Reading, Pennsylvania and Montgomery County, Ohio demonstrations, respectively. Appendix Table C describes the samples of data used in those reports.

groups in varied geographic areas. This large cross-section allows us to examine the different redemption patterns in urban and non-urban areas, and in inner-cities—areas cited by Congress to be "problem" areas due to "few supermarkets."⁵

In addition to examining the distribution of food stamp redemption patterns, the Maryland EBT system data are valuable for examining the transaction processing demands (both spatial and temporal) that a welfare caseload places on an EBT system; this includes the demands of both the FSP caseload and the cash benefit caseload. This report addresses both of these analytical needs by providing a descriptive summary of EBT transactions activity.

Report Organization

Chapter Two examines five main aspects of redemption behavior in the Food Stamp Program:

- (1) Frequency and timing of food stamp redemptions throughout the disbursement month;
- (2) Average purchase amounts, overall and by time since disbursement;
- (3) Distribution of purchases by store type;
- (4) Timing of benefit exhaustion; and
- (5) "Carryover" of benefits from one month to the next.

For each of these topics the report examines the *distribution* of caseload behavior, rather than concentrating solely on average behavior.

Chapter Three is analogous to Chapter Two, but examines the *cash redemption behavior* of AFDC and DALP recipients. This chapter examines:

5. U.S. House of Representatives, hearing of the Committee on Agriculture, "Ensure Adequate Access to Retail Food Stores by the Recipients of Food Stamps and to Maintain the Integrity of the Food Stamp Program," November 4, 1993.

- (1) Characteristics of the caseload: the mix of the cash benefit caseload according to the size of allotment, receipt of food stamp benefits in addition to cash benefits, and timing of disbursements;
- (2) Frequency and timing of cash withdrawal transactions throughout the disbursement month;
- (3) Average withdrawal amounts, overall and by time since disbursement; and
- (4) Number of transactions and average withdrawal amounts, by location (i.e., ATM *versus* POS device).

The following section describes the transactions data and the types of FSP-authorized retailers. A detailed description of our processing methods appears in Appendix A.

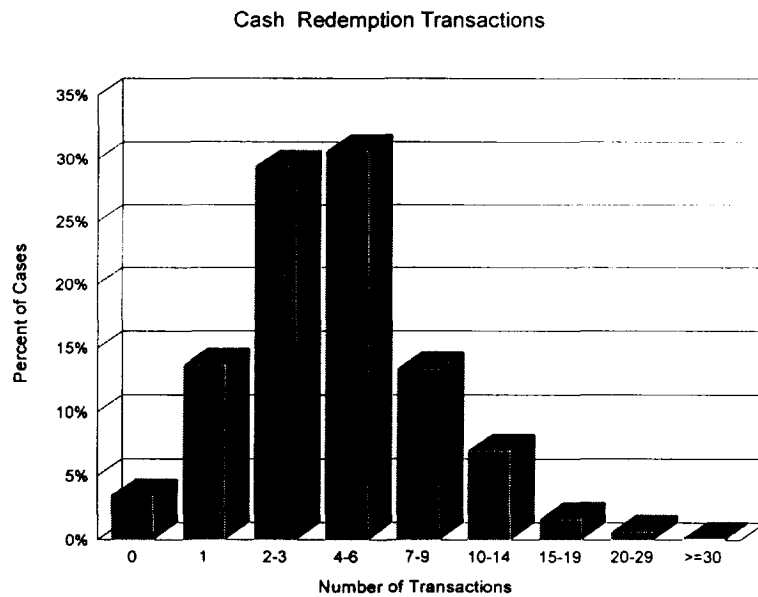
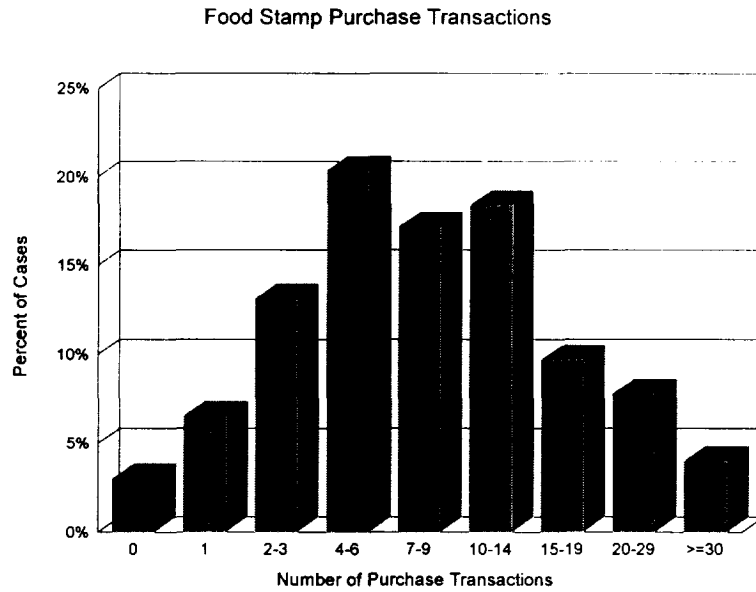
In addition to analyzing the redemption behavior of the Maryland caseload, we are able to match the actual transactions activity of a sample of recipients to survey data that were collected as part of the evaluation of the expanded EBT demonstration. Although a full analysis of these matched data is beyond the scope of this report, we have done some simple comparisons of the actual redemption behavior with reported shopping patterns. This analysis of the reliability of survey responses is included as Appendix B.

Description of Data

We obtained a file from Deluxe Data Systems of all transactions processed through the Maryland EBT system during the period from mid-August 1993 through October 1993. Deluxe Data Systems provides the central processing services for the Maryland EBT system. For reasons detailed in Appendix A, this report examines transactions activity in the September disbursement month only. For each case, the disbursement month is measured as the period beginning on the day the September allotment is received, and ending on the day prior to receipt of the October allotment.

The entire Maryland EBT caseload of food stamp and cash benefit recipients consists of approximately 170,000 cases. One calendar month of transactions activity contains approximately three million records. We processed these data to obtain a separate food stamp redemption history and cash benefit withdrawal history for each case. Figure 1.1 shows the distribution of the number

Figure 1.1
Distribution of EBT Transactions Per Case



of food stamp purchase transactions and cash benefit withdrawal transactions per case during September 1993. Appendix A contains a detailed description of the content of the transactions file and the methods that we used to process these data.

All of the analyses presented in this report correspond to the September 1993 *disbursement* month. The regular disbursement cycle is staggered over two three-day periods: the first, second, and third days of the month for cash benefits; the fifth, sixth, and seventh days for food stamp benefits. Because we analyze transaction activity in the disbursement month, we essentially align the transaction activity of each case to correspond to a "days since disbursement" time line; this smoothes over the calendar day variations that are due solely to the three-day disbursement cycle.

In addition to the regular disbursement cycle, both food stamp and cash benefit disbursements may occur throughout the month to new cases or on an emergency basis. New cases receive prorated benefits according to the number of days remaining in the disbursement cycle; cases receiving emergency benefits are observed to receive both a "regular" disbursement and a supplementary disbursement. In order to simplify the analysis, we restrict the sample to cases receiving only a "regular" disbursement in both September and October.⁶ This excludes: newly-opened cases; cases that, in September, were about to close; and cases that received supplementary benefits in addition to a regular disbursement.⁷ This simplification allows us to examine variations in transaction behavior without having to control for caseload heterogeneity—arising from differences in number of disbursements and length of disbursement month—that would otherwise be present in the data.

6. That is, we select cases that received regular cash benefit disbursements on the first, second, or third days of *both* months, or food stamp disbursements on the fifth, sixth, or seventh days of *both* months.

7. We could only identify ongoing cases based on the date of benefit disbursement. Therefore, it is possible that we have included new cases that happened to enter the caseload at the beginning of the month.

Table 1.1 describes the composition of the entire caseload in terms of the timing of disbursement in September 1993. Ninety percent of the September food stamp caseload received a single monthly disbursement on one of the regular disbursement dates (the fifth, sixth, or seventh days). Of those regular cases, 97 percent redeemed at least some of their benefits during the calendar month. In contrast, of the food stamp cases receiving an "irregular" disbursement, 88 percent redeemed benefits during the calendar month.⁸ Less than 2 percent of cases received supplementary benefits in addition to their regular disbursement.

Cash benefit cases are characterized by a lower percentage of "regular" disbursements compared to food stamp cases. Much of this difference is due to the disbursement of the child support bonus (98.4 percent of cases received the bonus on the 21st of the month; nearly all of the remainder received the bonus on the first day).⁹ Cases receiving the bonus in addition to a regular disbursement are considered "regular" cases for purposes of inclusion in our analysis sample.

All tables in this report are based on either the entire caseload (column 1) or cases with a "regular" disbursement (column 5). The sample used for analysis (column 5) represents 81 percent of all food stamp cases, and 90 percent of all cases with a regular disbursement in September (the remaining 10 percent of regular cases either did not receive an October disbursement or did not redeem any benefits in September). The analysis sample of cash benefit recipients (column 5, lower panel) represents 71 percent of all cash benefit cases, and 85 percent of all cases with a regular disbursement in September.

8. "Irregular" benefits received at the end of the disbursement month might be more subject to "saving" behavior—i.e., accumulation of benefits across disbursement periods. This is because the time between disbursements is short (irregular disbursements to newly-opened cases are subsequently followed by "regular" disbursements), and because the irregular disbursement may be prorated. In addition, we may observe what appears to be "saving" behavior if recipients are slow in learning to use their EBT card. Hence, we make the distinction between "regular" disbursement cases and "irregular" disbursement cases.

9. The maximum child support bonus is \$50; 90 percent of all bonus disbursements in the September calendar month were for the maximum amount.

Table 1.1

MARYLAND CASELOAD COMPOSITION

Cases Receiving a Disbursement in September 1993

	Total Cases		Cases with Transactions in September		Analysis Sample (Regular disbursement in Sep. and Oct.)	
	Number	Percent	Number	Row Percent	Number	Percent of (1)
	(1)	(2)	(3)	(4)	(5)	(6)
Food Stamp Cases						
Total	159,054	100.00%	153,039	96.22%		
Regular Disbursement Only*	143,718	90.36	139,345	96.96	129,594	90.17%
Irregular Disbursement Only	13,216	8.31	11,602	87.79	-	-
Regular + Supplement	2,120	1.33	2,092	98.68	-	-
Cash Benefit Cases						
Total	104,180	100.00%	100,553	96.52%		
Regular Disbursement Only*	76,335	73.27	74,599	97.73	64,294	84.23%
Regular + Child Support Bonus	11,678	11.21	11,365	97.32	10,163	87.03%
Irregular Disbursement Only	7,235	6.94	6,504	89.90	-	-
Regular + Supplement	5,570	5.35	5,463	98.08	-	-
NPA-CS Only**	3,362	3.23	2,622	77.99	-	-

Source: Maryland EBT Transactions Log from Deluxe Data Systems, September 1993 disbursement month.

*Regular" Food Stamp disbursements are issued on the 5th, 6th, 7th of the month; "regular" cash benefits disbursements are issued on the 1st, 2nd, 3rd of the month. Column (5) is a subset of column (3).

Food Stamp Program-Authorized Retailers

Food stamp benefits may be redeemed at a variety of locations for food items for home preparation and consumption. Authorized retailers include supermarkets, small and medium grocery stores, specialty food stores (e.g., produce and seafood stores), convenience stores, and certain stores that sell a variety of merchandise, including food. In addition, elderly and disabled recipients may redeem food stamps for home-delivered meals, and homeless recipients may redeem food stamps for prepared meals at shelters.

We identified "store type" based on a listing of FSP-authorized retailers obtained from the Food and Consumer Service's (FCS) Minneapolis Computer Service Center.¹⁰ Table 1.2 lists the types of authorized redemption locations in Maryland and the aggregate volume of food stamp transactions and purchase amounts at each type of location during the September disbursement month.¹¹ Throughout this report we concentrate on the four main retailer types (supermarkets, grocery stores, specialty stores, and convenience stores), and group all other redemption locations in the "other" category. The one modification that we make to the FSP "store type" categorization is that we group "combination grocery and gas" and "combination grocery and merchandise" locations together with "convenience stores".¹²

10. Store type is self-reported by the retailer at the time of application to the FSP.

11. The redemption numbers are based on *all* food stamp cases redeeming benefits in September, not just those in the analysis sample.

12. This categorization is similar to that used in the evaluation's final report (and previous EBT evaluations). In past reports, "grocery stores" and "specialty stores" have been grouped together as "grocery stores."

Table 1.2
FSP-AUTHORIZED RETAILERS IN MARYLAND

		Purchase Transaction Volume					
		Number of Locations		Number of Transactions		Dollars Redeemed	
		Number	Percent	Number	Percent	Amount	Percent
Supermarket	(SM)	547	16.9%	723,222	43.8%	20,219,786	71.8%
Small/Medium Grocery	(GS)	800	24.7%	465,196	28.2%	2,920,515	10.4%
Specialty Food	(SF)	314	9.7%	132,647	8.0%	2,654,407	9.4%
Convenience Stores:							
Convenience Store	(CS)	971	30.0%	184,915	11.2%	997,501	3.5%
Comb. Groc/Gas	(CG)	42	1.3%	12,904	0.8%	49,723	0.2%
Comb. Groc/Merchandise	(CM)	40	1.2%	6,018	0.4%	48,710	0.2%
Other Stores:							
Total		445	13.8%	124,715	7.6%	1,253,949	4.5%
Alcoholic Treatment	(AT)	3	0.1%	81	0.0%	7,642	0.0%
Non-profit Coop	(BC)	13	0.4%	795	0.0%	14,161	0.1%
Bread Route	(BR)	6	0.2%	914	0.1%	17,693	0.1%
Comb. Groc/Bar	(CB)	10	0.3%	2,053	0.1%	14,380	0.1%
Other Combination	(CO)	139	4.3%	52,047	3.2%	510,264	1.8%
Comb. Groc/Restaurant	(CR)	59	1.8%	22,363	1.4%	200,071	0.7%
Drug Addict Treatment	(DT)	1	0.0%	9	0.0%	1,057	0.0%
Farmers Market	(FM)	12	0.4%	3,614	0.2%	82,973	0.3%
Group Living Arrangment	(GL)	1	0.0%	10	0.0%	923	0.0%
Health/Natural Food	(HF)	29	0.9%	852	0.1%	15,779	0.1%
Homeless Meal Provider	(HP)	1	0.0%	5	0.0%	300	0.0%
Military Commissary	(MC)	8	0.2%	373	0.0%	27,377	0.1%
Non-profit Meal Delivery	(ND)	3	0.1%	13	0.0%	240	0.0%
Non-profit Communal Dining	(NP)	4	0.1%	5	0.0%	202	0.0%
Other Firm	(OF)	60	1.9%	20,134	1.2%	143,042	0.5%
Other Route	(OR)	26	0.8%	2,110	0.1%	53,849	0.2%
Produce Route	(PR)	7	0.2%	110	0.0%	6,117	0.0%
Produce Stand	(PS)	52	1.6%	18,527	1.1%	134,080	0.5%
Wholesaler	(WH)	11	0.3%	700	0.0%	23,800	0.1%
Unknown*		74	2.3%	1,737	0.1%	4,166	0.0%
All Locations		3,233	100.0%	1,651,354	100.0%	28,148,755	100.0%

Source: FCS Minneapolis Computing Service Center and Deluxe Transactions Log File. Number of retailers includes authorized retailers at which no redemptions occurred in September 1993. Excludes transactions made in 39 out-of-state stores which accounted for 0.3% of transactions and 0.5% of food stamp dollars redeemed.

* Unknown store type is due to the presence of newly authorized retailers in the transactions database that could not be matched to the master list of retailers from the Minneapolis Computer Service Center.

CHAPTER TWO

FOOD STAMP BENEFIT REDEMPTION PATTERNS

This chapter presents a description of food stamp recipients' redemption behavior. The main purpose is to examine the heterogeneity within the caseload with respect to the frequency of benefit redemption, average purchase amounts, location of benefit redemption (i.e., types of stores), and speed of benefit exhaustion. For example, the variation with respect to location of benefit redemption (i.e., store types) provides some evidence of the variation in access to different types of authorized food stamp retailers. In addition to the behavioral implications, the simple patterns of benefit redemption—in terms of the volume and timing of redemption transactions—provide information about operational requirements and peakload capacity requirements that may be useful for the general planning purposes of future EBT systems.¹³

Food stamp recipients in Maryland made over 1.3 million EBT purchases in September 1993, spending over \$23.5 million in benefits. Figures 2.1 through 2.3 display the main characteristics of these food stamp redemptions: most redemption activity (in terms of both transactions and dollars redeemed) occurs early in the disbursement month; the majority of both transactions and purchases occur at supermarkets; and average purchase amounts at all store types, except convenience stores, fall precipitously during the first week after disbursement and then level off.¹⁴ Somewhat surprisingly, Figure 2.4 shows that the distribution of both transactions and dollars redeemed across store types remains fairly constant throughout the disbursement month. One would have expected the opposite if, for example, a majority of recipients redeem the bulk of their benefits during a supermarket trip early in the disbursement month and then shop at smaller, more accessible stores later in the month.

13. Throughout this chapter, the term "transaction" refers to redemption transactions and *does not include* food stamp refunds, balance inquiries, or rejected or reversed transactions.

14. Recall that by examining a disbursement-month time line, instead of the calendar month, we have smoothed over day-of-the-week variations. Even on a calendar timeline, however, these data do not display the Saturday peaks that were found in the Reading and Ohio demonstration data. This may be because the disbursement dates (fifth-seventh) fell on Sunday-Tuesday in September 1993.

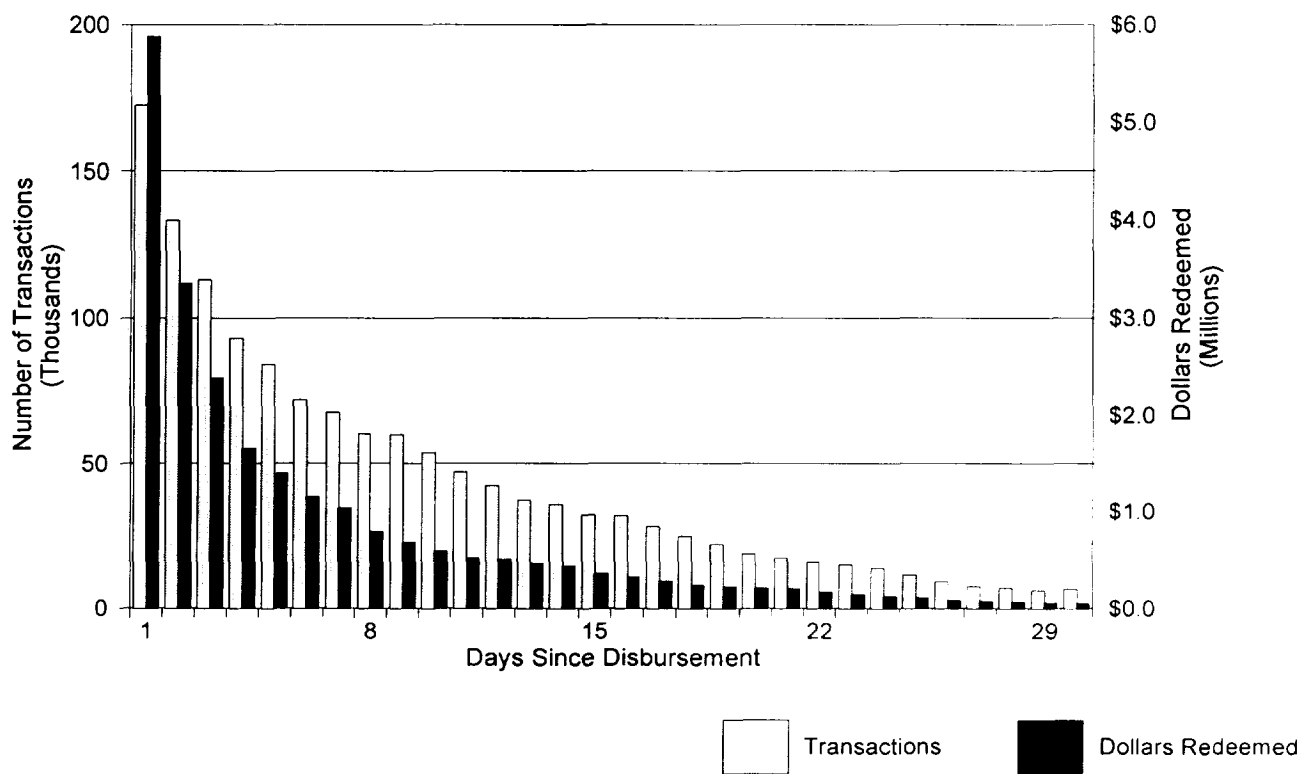
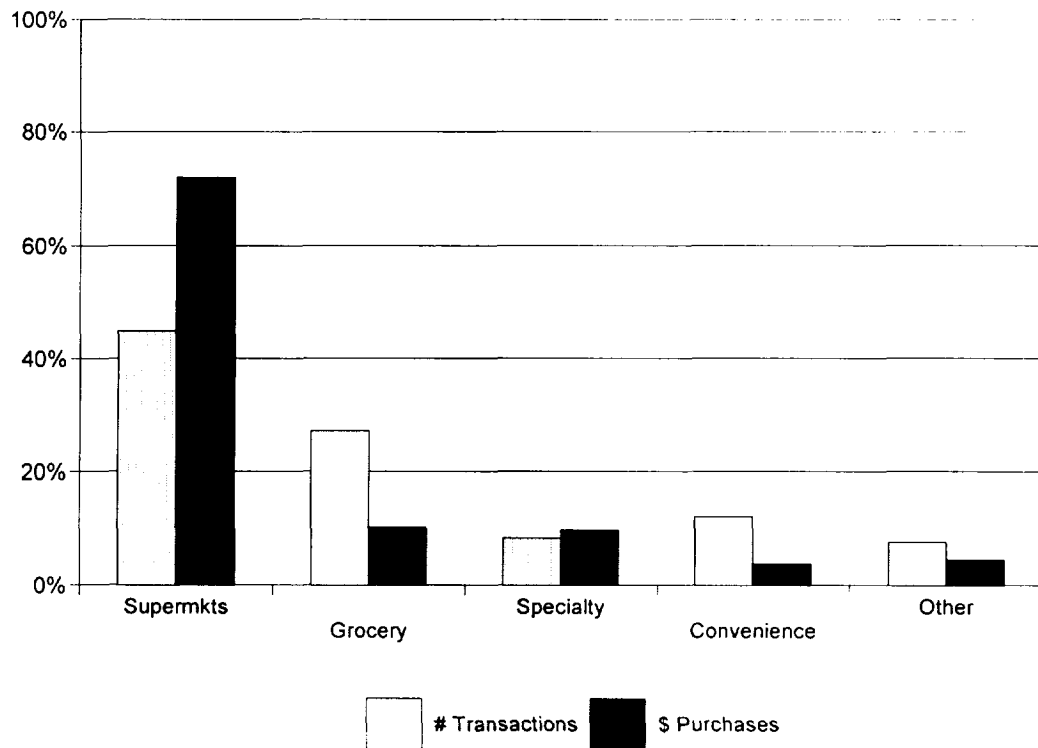


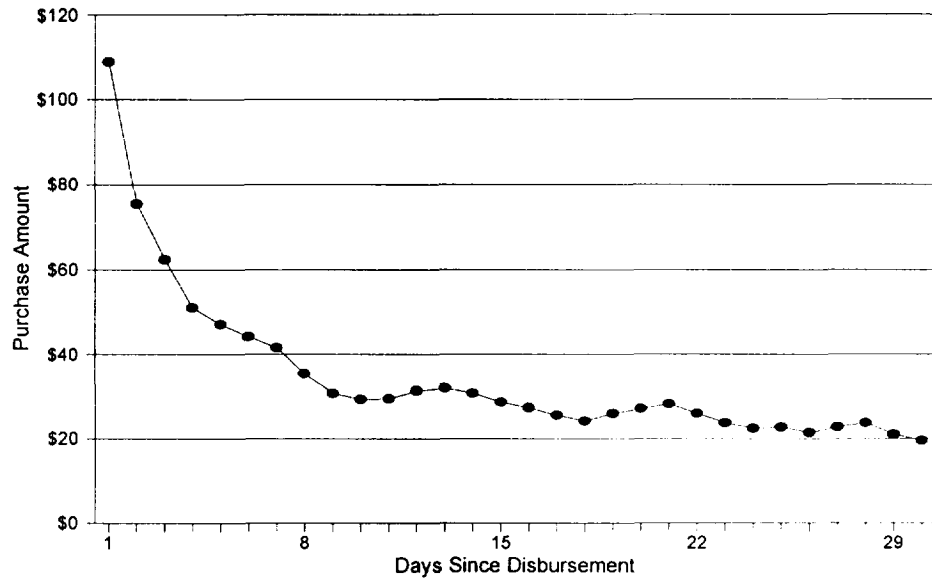
Figure 2.2
Share of Monthly Transactions and Purchases By Store Type



Prepared by Abt Associates Inc.

Figure 2.3

Average Purchase Amount at Supermarkets



Average Purchase Amount at Other Store Types

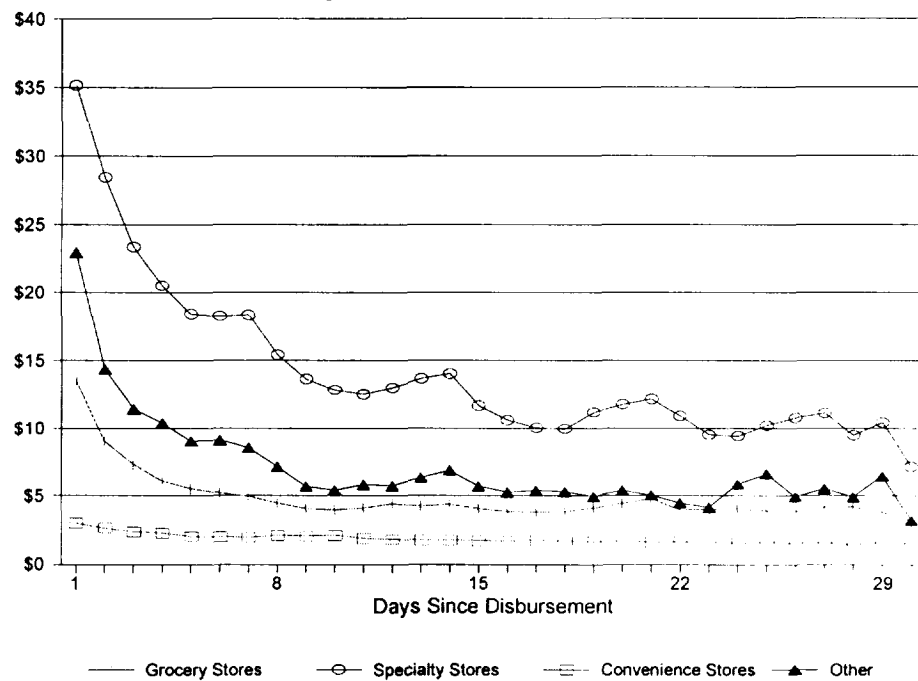
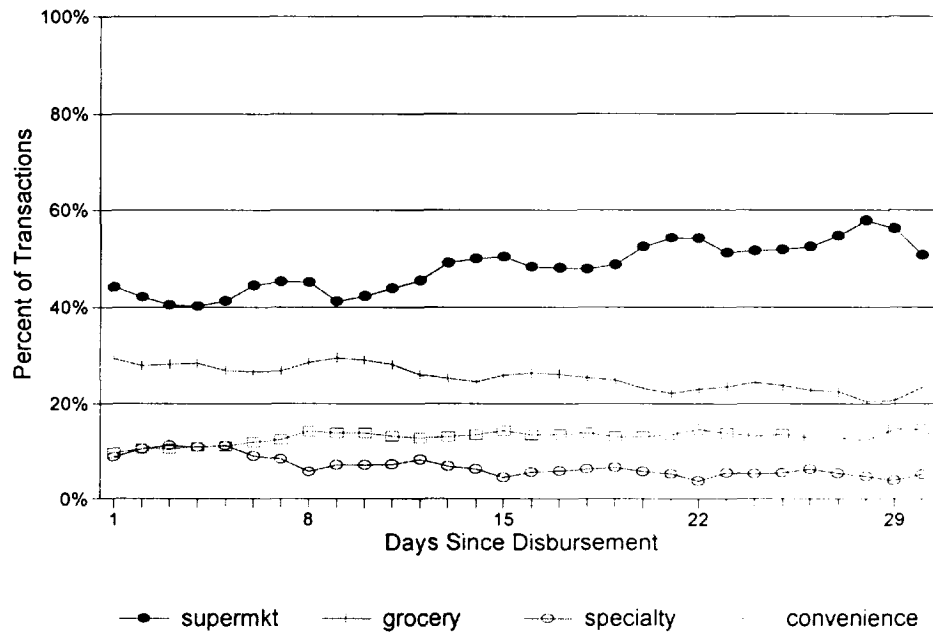


Figure 2.4

Percent of Food Stamp Transactions
By Store Type



Percent of Food Stamp Dollars Redeemed
By Store Type

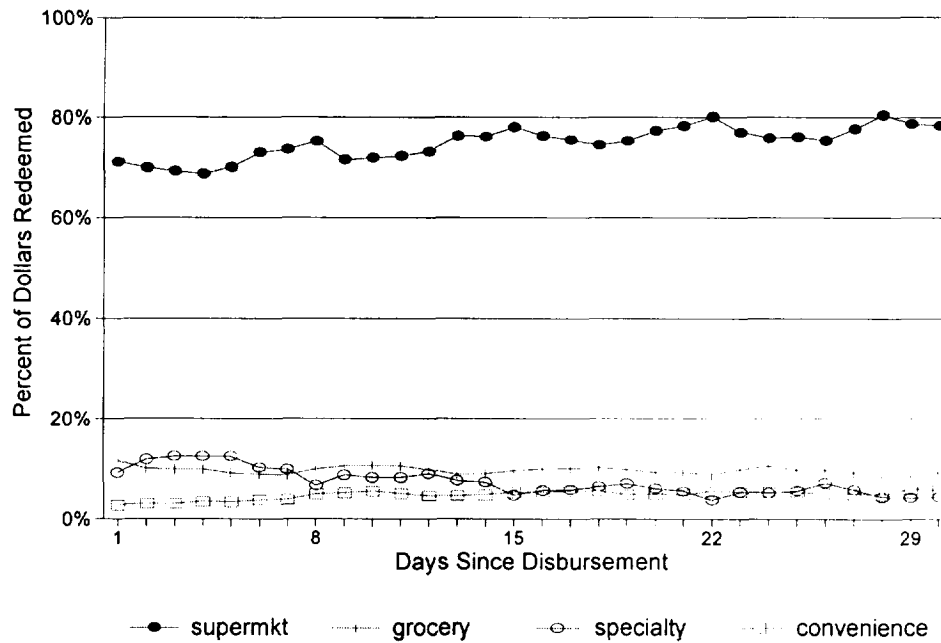


Table 2.1 provides a detailed description of redemption activity in Maryland in September 1993. The distribution of the caseload and redemption characteristics are shown for each county and by the metropolitan/non-metropolitan breakdown of the caseload.¹⁵ Over \$23 million of food stamp benefits were issued in September to the analysis sample; nearly half of that was disbursed in Baltimore City, so statewide statistics are heavily dominated by the characteristics of the most urban population of recipients. The table shows that, on average, recipient households make a little over ten purchase transactions per month, or about seven transactions per \$100 of benefits. The average purchase amount over the entire month is about \$18. Recipients in Baltimore City, on average, make more transactions for smaller purchase amounts than recipients in the rest of the state.

The far right columns of Table 2.1 show the speed of benefit exhaustion; this essentially translates the "volume of redemptions per day since disbursement" (Figure 2.1) into statistics that characterize case-level behavior. The average recipient spends 23 percent of his or her allotment on the day of disbursement, and 70 percent by the end of the first week; halfway through the month, the average recipient has exhausted nearly 90 percent of his or her benefits. The pattern of benefit exhaustion does not vary greatly across counties. Below we explore other sources of heterogeneity.

Redemption Behavior by Case Type, Location, and Allotment Size

Tables 2.2 through 2.4 show how redemption behavior varies with the mix of the caseload. These tables contain information for subgroups defined by: (1) type of welfare case (FSP only, FSP plus AFDC cash benefits, and FSP plus DALP cash benefits); (2) location; and (3) size of monthly allotment. For "location", we categorize recipients according to whether they reside in a "metro" county (i.e., a county within the boundaries of an SMSA, excluding Baltimore City) or a "non-metro" county (i.e., outside an SMSA), or whether they reside in Baltimore City.

15. "Metro" counties are those within SMSA borders, excluding Baltimore City; "non-metro" counties are all other counties.

TABLE 2.1
FOOD STAMP BENEFIT REDEMPTION IN MARYLAND
CASES WITH "REGULAR" MONTHLY DISBURSEMENT
SEPTEMBER 1993

	Number of cases	Total Issuance	Average Allotment	Total Redemptions	Number of Purchases	Avg # Purchases		Average Purchase Amount	Avg Percent of Benefits Spent by:			
						per case	per \$100 allot.*		Day 1	Day 7	Day 14	Day 21
State Total	129,594	23,461,179	181.04	23,582,220	1,336,697	10.31	7.02	17.64	22.90	70.80	88.81	97.19
Non-Metro Counties	11,051	1,802,639	163.12	1,814,173	83,938	7.60	6.22	21.68	20.24	67.12	86.96	97.15
Metro Counties	52,809	9,739,278	184.42	9,801,227	405,452	7.68	5.25	24.34	20.13	65.54	85.70	96.08
Baltimore City	65,721	11,916,269	181.32	11,963,654	847,183	12.89	8.57	14.12	25.57	75.65	91.61	98.09
County:												
Allegany	3,034	494,448	162.97	494,290	27,099	8.93	7.28	18.24	21.06	65.56	85.80	96.55
Anne Arundel	5,476	1,031,624	188.39	1,038,102	41,242	7.53	5.10	25.17	21.77	68.17	87.63	97.04
Baltimore	10,524	1,917,315	182.19	1,926,408	87,305	8.30	5.58	22.07	20.11	65.30	85.63	95.79
Calvert	820	142,401	173.66	142,632	5,674	6.92	5.25	25.14	20.04	66.08	85.76	95.36
Caroline	577	86,739	150.33	87,574	4,326	7.50	6.81	20.24	17.92	66.93	88.74	99.80
Carroll	1,016	170,003	167.33	171,794	6,701	6.60	5.40	25.64	18.27	60.08	81.84	95.35
Cecil	1,754	302,732	172.60	305,503	12,183	6.95	5.11	25.08	12.00	61.48	82.65	95.23
Charles	2,114	401,252	189.81	402,150	15,586	7.37	4.76	25.80	20.90	67.10	85.77	95.38
Dorchester	1,157	179,754	155.36	180,383	8,989	7.77	6.83	20.07	26.37	71.21	89.74	97.79
Frederick	1,841	311,482	169.19	313,585	13,340	7.25	5.67	23.51	19.54	61.28	82.46	96.13
Garrett	950	161,342	169.83	161,287	7,575	7.97	5.78	21.29	20.39	62.98	82.47	94.59
Harford	2,489	426,229	171.25	430,034	18,612	7.48	5.59	23.11	21.26	66.86	86.31	96.91
Howard	1,285	230,688	179.52	232,522	9,459	7.36	5.42	24.58	20.52	64.48	85.32	96.39
Kent	339	41,819	123.36	41,914	2,197	6.48	7.99	19.08	17.16	65.57	87.65	98.75
Montgomery	7,617	1,354,531	177.83	1,366,193	54,726	7.18	5.20	24.96	16.35	60.23	82.78	95.02
Prince George's	13,575	2,753,906	202.87	2,775,707	100,640	7.41	4.31	27.58	20.90	68.06	87.19	96.42
Queen Anne's	429	62,547	145.80	63,479	2,646	6.17	6.00	23.99	14.95	63.99	85.57	98.70
St Mary's	1,519	280,880	184.91	283,398	11,998	7.90	5.35	23.62	19.29	65.50	85.88	96.41
Somerset	910	143,695	157.91	143,435	7,513	8.26	7.18	19.09	26.37	72.58	90.56	97.91
Talbot	665	93,333	140.35	94,761	4,162	6.26	6.31	22.77	15.40	65.06	86.32	97.17
Washington	2,589	442,851	171.05	444,329	22,422	8.66	6.53	19.82	22.93	66.66	85.94	95.63
Wicomico	2,212	366,068	165.49	368,909	17,802	8.05	6.60	20.72	23.98	71.29	89.39	98.43
Worcester	968	146,276	151.11	147,009	7,193	7.43	6.46	20.44	20.70	66.42	87.74	97.78
Baltimore City	65,721	11,916,269	181.32	11,963,654	847,183	12.89	8.57	14.12	25.57	75.65	91.61	98.09

Notes: * The number of transactions per \$100 allotment is calculated first for each case, and then averaged over cases.
The sample of 129,594 cases excludes 2.8% (3,700 cases) that received benefits in September but made no redemption transactions.
The Total caseload does not match the sum over regions due to 13 cases with missing county code.

Table 2.2 shows the distribution of the caseload by these subgroups and the mean number of food stamp purchase transactions per subgroup. This table yields two findings. First, the difference in transaction volume between Baltimore City and the remainder of the state cannot be explained by case type (i.e., public assistance (PA) *versus* non-public assistance (NPA) cases), or by allotment level. For each case type (i.e., each column), Baltimore City recipients exhibit a greater mean number of transactions than recipients in other geographic areas. Within each column, Baltimore City recipients exhibit a greater mean number of transactions at each allotment level.

Second, the difference in transaction behavior across case types (the *column* differences) can be explained by the different distributions of monthly allotments for PA and NPA households.

For example, in all geographic areas, food stamp-AFDC cases exhibit a mean number of transactions that is nearly twice that of food stamp-only cases, but this difference does not exist when we make the comparison at each allotment level. In other words, there is very little difference in the within-area transactions behavior of NPA and PA cases once we control for allotment size. The bottom line is that EBT transaction levels depend primarily on the distribution of the food stamp caseload with respect to *allotment size* and *area of residence*.

Table 2.3 presents the breakdown of the mean number of transactions per \$100 of benefits and the average purchase amount. Again, the point is to compare redemption behavior across regions controlling for case mix. These tables also provide information about the expected use of an EBT system. For example, the average number of transactions per case increases with allotment size, but at a decreasing rate. To see this, Table 2.2 shows the mean number of transactions per case rising with allotment size, whereas Table 2.3 shows the mean number of transactions per \$100 allotment decreasing with allotment size. This occurs because (as shown on Table 2.3) the average purchase amount increases with allotment size. (Note that the average purchase amount does not vary across case type once we control for allotment; this must be true, because the mean number of transactions does not vary across case type once we control for allotment.)

Table 2.2
MEAN NUMBER OF FOOD STAMP TRANSACTIONS
By Case Type, Location, and Allotment Size*

Case Type:	Number of Cases			Mean Number of Transactions		
	Food Stamp Only	Food Stamp & AFDC	Food Stamp & DALP	Food Stamp Only	Food Stamp & AFDC	Food Stamp & DALP
State Total	50,963	63,449	15,182	6.9	13.2	9.8
Non-Metro Counties						
Total	6,537	4,129	385	5.9	10.4	7.0
<i>By Allotment Size:</i>						
\$10	483	3	2	1.7	1.3	2.5
\$11-100	2,817	160	28	3.4	4.3	4.1
\$101-200	2,001	1,040	330	7.1	8.2	7.2
\$201-300	916	2,051	24	10.3	10.4	8.3
\$301-400	238	672	1	13.2	13.7	13.0
\$401-500	57	176	.	15.2	15.1	.
\$501-600	20	25	.	15.9	16.4	.
\$601+	5	2	.	18.2	12.5	.
Metro Counties						
Total	23,907	26,120	2,782	5.8	9.4	7.4
<i>By Allotment Size:</i>						
\$10	1,194	6	2	1.6	2.2	1.5
\$11-100	10,081	540	142	3.5	4.1	5.6
\$101-200	7,884	6,302	2,405	6.8	7.3	7.1
\$201-300	3,460	13,744	202	9.3	9.3	11.2
\$301-400	938	4,327	21	12.1	11.9	13.9
\$401-500	248	1,034	6	14.9	14.1	12.8
\$501-600	82	133	3	14.2	15.8	23.3
\$601+	20	34	1	17.8	20.1	21.0
Baltimore City						
Total	20,515	33,192	12,014	8.5	16.5	10.5
<i>By Allotment Size:</i>						
\$10	883	24	3	2.4	2.0	4.0
\$11-100	9,476	838	239	5.4	7.0	7.8
\$101-200	7,459	7,915	11,456	10.5	12.7	10.4
\$201-300	2,071	16,573	304	14.9	16.0	16.2
\$301-400	454	5,967	12	19.7	20.8	18.2
\$401-500	133	1,593	.	23.1	25.8	.
\$501-600	30	226	.	31.3	32.5	.
\$601+	9	56	.	29.1	35.4	.

Notes: September disbursement month. Cases with "regular" monthly disbursement. See footnote on Table 2.1.
State Total does not match the sum over regions due to 13 cases with missing county code.

* The \$10 allotment group contains 72 cases (3% across all locations) that received an allotment of \$2-9.

Table 2.3
MEAN TRANSACTIONS PER \$100 DISBURSEMENT AND AVERAGE PURCHASE AMOUNTS
By Case Type, Location, and Allotment Size*

Case Type:	Mean Transactions Per \$100 Allotment			Average Purchase Amount		
	Food Stamp Only	Food Stamp & AFDC	Food Stamp & DALP	Food Stamp Only	Food Stamp & AFDC	Food Stamp & DALP
State Total	8.52	5.41	8.69	16.61	19.13	11.74
Non-Metro Counties						
Total	7.29	4.48	6.45	19.80	23.55	16.71
<i>By Allotment Size:</i>						
\$10	17.46	13.33	25.00	6.93	7.18	3.99
\$11-100	8.25	7.04	6.81	14.71	15.91	16.92
\$101-200	5.47	5.00	6.51	18.95	20.42	15.78
\$201-300	4.27	4.27	3.78	23.68	23.58	27.57
\$301-400	3.82	3.99	4.17	26.25	25.07	24.02
\$401-500	3.47	3.51	.	28.99	28.57	.
\$501-600	3.00	3.12	.	33.32	32.06	.
\$601+	2.78	2.03	.	36.21	49.67	.
Metro Counties						
Total	6.59	3.92	6.26	21.12	26.55	16.52
<i>By Allotment Size:</i>						
\$10	16.49	25.00	15.00	7.41	7.02	6.67
\$11-100	7.76	6.17	7.07	15.47	17.81	14.85
\$101-200	5.30	4.29	6.33	19.66	23.64	15.88
\$201-300	3.89	3.85	5.10	26.08	26.21	20.06
\$301-400	3.48	3.49	3.99	28.86	28.71	24.36
\$401-500	3.37	3.24	2.92	29.78	30.89	32.51
\$501-600	2.66	2.96	4.35	37.63	33.85	22.47
\$601+	2.58	2.99	3.15	37.61	34.33	32.18
Baltimore City						
Total	11.16	6.70	9.32	12.32	15.45	10.86
<i>By Allotment Size:</i>						
\$10	24.93	23.82	40.00	4.65	5.11	2.50
\$11-100	13.36	10.17	9.36	9.12	10.43	11.33
\$101-200	8.56	7.31	9.37	12.12	13.79	10.74
\$201-300	6.25	6.51	7.57	16.15	15.48	13.21
\$301-400	5.68	6.09	5.06	17.65	16.43	19.88
\$401-500	5.28	5.95	.	19.20	16.78	.
\$501-600	5.78	6.09	.	16.95	16.44	.
\$601+	4.21	5.41	.	23.82	18.57	.

Notes: September disbursement month. Cases with "regular" monthly disbursement. See footnote on Table 2.1.
 * The \$10 allotment group contains 72 cases (3% across all locations) that received an allotment of \$2-9.

Table 2.4
FOOD STAMP REDEMPTIONS AT SUPERMARKETS
 By Case Type, Location, and Allotment Size*

Subgroup	Average Fraction of Benefits Redeemed At Supermarkets			Fraction of Cases NEVER Redeeming Benefits at Supermarkets		
	Food Stamp Only	Food Stamp & AFDC	Food Stamp & DALP	Food Stamp Only	Food Stamp & AFDC	Food Stamp & DALP
State Total	0.77	0.72	0.56	0.07	0.03	0.15
Non-Metro Counties						
Total	0.85	0.85	0.82	0.05	0.01	0.05
<i>By Allotment Size:</i>						
\$10	0.82	1.00	0.53	0.16	0.00	0.50
\$11-100	0.87	0.87	0.88	0.06	0.04	0.04
\$101-200	0.84	0.85	0.81	0.03	0.01	0.05
\$201-300	0.86	0.85	0.84	0.01	0.01	0.00
\$301-400	0.86	0.83	0.91	0.01	0.00	0.00
\$401-500	0.85	0.82	.	0.00	0.01	.
\$501-600	0.87	0.84	.	0.00	0.00	.
\$601+	0.83	0.98	.	0.00	0.00	.
Metro Counties						
Total	0.86	0.83	0.81	0.04	0.01	0.03
<i>By Allotment Size:</i>						
\$10	0.86	0.80	1.00	0.11	0.17	0.00
\$11-100	0.86	0.85	0.87	0.06	0.03	0.02
\$101-200	0.85	0.85	0.81	0.02	0.01	0.03
\$201-300	0.86	0.84	0.79	0.01	0.01	0.02
\$301-400	0.84	0.82	0.69	0.00	0.01	0.10
\$401-500	0.81	0.80	0.60	0.01	0.00	0.00
\$501-600	0.81	0.82	0.77	0.00	0.00	0.00
\$601+	0.79	0.79	0.59	0.00	0.00	0.00
Baltimore City						
Total	0.65	0.62	0.50	0.12	0.05	0.18
<i>By Allotment Size:</i>						
\$10	0.65	0.53	0.50	0.27	0.42	0.33
\$11-100	0.68	0.66	0.55	0.14	0.12	0.21
\$101-200	0.61	0.64	0.49	0.11	0.05	0.18
\$201-300	0.67	0.62	0.58	0.03	0.05	0.06
\$301-400	0.66	0.59	0.46	0.02	0.04	0.25
\$401-500	0.64	0.58	.	0.03	0.02	.
\$501-600	0.70	0.51	.	0.00	0.06	.
\$601+	0.54	0.52	.	0.00	0.04	.

Notes: September disbursement month. Cases with "regular" monthly disbursement. See footnote on Table 2.1.

* The \$10 allotment group contains 72 cases (3% across all locations) that received an allotment of \$2-9.

One of the most striking characteristics of food stamp benefit redemption behavior in Maryland is the differential use of supermarkets in Baltimore City relative to the rest of the state. Table 2.4 shows that food stamp recipients in Baltimore City redeem from 50-65 percent of their benefits at supermarkets, whereas residents in the remainder of the state redeem over 80 percent of their benefits at supermarkets. In addition, 10 percent of all food stamp recipients in Baltimore City never shopped at a supermarket in September 1993, whereas this is true of only 2.5 percent of recipients in the remainder of the state. These differences cannot be explained by case mix or allotment size. Below we explore possible reasons for this observed difference in redemption behavior.

Food Stamp Redemption By Store Type

Two hypotheses come to mind as to why food stamp recipients in Baltimore City are less likely to shop at supermarkets than food stamp recipients living elsewhere in Maryland. First, there may simply be a relative scarcity of supermarkets within the city. Alternatively, there may be relatively more non-supermarket retail outlets in Baltimore City, and these stores may serve as "intervening opportunities" when clients go shopping for food.¹⁶

At first glance, it appears that there *is* a relative scarcity of supermarkets in Baltimore City. As shown in Table 2.5, less than 6 percent of all retailers in Baltimore City are supermarkets, whereas supermarkets represent 18 percent of retailers in non-metro counties and 26 percent of retailers in metro counties. The *distribution* of retailers, however, can be a misleading indicator of "access" to supermarkets. In fact, Baltimore City has 1.02 supermarkets per 10,000 residents, compared to 1.08 supermarkets per 10,000 residents in all other metro counties and 1.59 in non-metro counties. Although the Baltimore City retailer mix is substantially different than that in other areas of the state, it does not necessarily reflect a situation of inadequate access to large supermarkets.

16. Other hypotheses can be imagined as well (e.g., relative differences in food prices or service levels), but we have no data to explore these other hypotheses.

TABLE 2.5
FOOD STAMP REDEMPTIONS BY STORE TYPE AND COUNTY
SEPTEMBER 1993

	Total Stores	Fraction of Stores By Type:					Average fraction of transactions per case, by store type:					Average fraction of purchases per case, by store type:				
		Super-	Small	Specialty	Conv.	Other	Super-	Grocery	Specialty	Conv.	Other	Super-	Grocery	Specialty	Conv.	Other
		market	Grocery	Stores	Stores	Stores	markets	Stores	Stores	Stores*	Stores	markets	Stores	Stores	Stores*	Stores
State Total	3,257	0.17	0.25	0.10	0.32	0.16	0.59	0.19	0.08	0.09	0.05	0.72	0.11	0.09	0.04	0.04
Non-Metro Counties	389	0.20	0.18	0.08	0.43	0.11	0.74	0.09	0.03	0.13	0.02	0.85	0.06	0.03	0.05	0.01
Metro Counties**	1,598	0.26	0.13	0.09	0.43	0.10	0.75	0.07	0.06	0.10	0.02	0.84	0.04	0.06	0.04	0.02
Baltimore City	1,285	0.06	0.41	0.12	0.16	0.25	0.43	0.30	0.11	0.08	0.09	0.61	0.16	0.13	0.04	0.07
County:																
Allegany	95	0.17	0.16	0.21	0.32	0.15	0.64	0.16	0.00	0.15	0.05	0.81	0.10	0.00	0.06	0.03
Anne Arundel	176	0.25	0.09	0.06	0.52	0.09	0.73	0.04	0.05	0.14	0.04	0.82	0.02	0.06	0.05	0.05
Baltimore	309	0.26	0.10	0.09	0.41	0.13	0.76	0.06	0.06	0.10	0.02	0.85	0.03	0.06	0.03	0.03
Calvert	36	0.17	0.17	0.11	0.50	0.06	0.59	0.26	0.04	0.09	0.02	0.68	0.23	0.06	0.03	0.00
Caroline	34	0.15	0.24	0.12	0.38	0.12	0.77	0.08	0.03	0.12	0.00	0.88	0.04	0.03	0.05	0.00
Carroll	67	0.22	0.07	0.09	0.48	0.13	0.83	0.02	0.01	0.13	0.01	0.91	0.01	0.01	0.05	0.02
Cecil	50	0.10	0.20	0.08	0.50	0.12	0.72	0.07	0.01	0.19	0.01	0.88	0.04	0.01	0.07	0.00
Charles	58	0.17	0.12	0.10	0.50	0.10	0.70	0.08	0.09	0.11	0.02	0.80	0.05	0.10	0.04	0.01
Dorchester	30	0.17	0.40	0.07	0.30	0.07	0.67	0.23	0.04	0.06	0.00	0.81	0.13	0.03	0.02	0.01
Frederick	56	0.38	0.05	0.07	0.39	0.11	0.91	0.04	0.01	0.03	0.01	0.95	0.02	0.01	0.01	0.01
Garrett	35	0.14	0.23	0.09	0.43	0.11	0.73	0.05	0.01	0.13	0.08	0.87	0.03	0.00	0.05	0.05
Harford	88	0.28	0.10	0.03	0.50	0.08	0.76	0.06	0.01	0.16	0.01	0.89	0.03	0.02	0.05	0.01
Howard	49	0.35	0.06	0.04	0.49	0.06	0.84	0.04	0.03	0.08	0.01	0.89	0.03	0.04	0.03	0.01
Kent	14	0.29	0.14	0.07	0.50	0.00	0.85	0.07	0.01	0.08	0.00	0.94	0.03	0.00	0.03	0.00
Montgomery	217	0.38	0.14	0.04	0.33	0.11	0.83	0.09	0.03	0.04	0.01	0.86	0.08	0.04	0.01	0.01
Prince George's	332	0.23	0.14	0.11	0.44	0.08	0.74	0.04	0.10	0.11	0.01	0.82	0.03	0.11	0.03	0.01
Queen Anne's	19	0.16	0.16	0.11	0.42	0.16	0.83	0.07	0.02	0.07	0.01	0.91	0.03	0.02	0.02	0.02
St Mary's	54	0.20	0.11	0.04	0.46	0.19	0.77	0.08	0.03	0.08	0.04	0.84	0.06	0.04	0.03	0.03
Somerset	32	0.13	0.09	0.09	0.53	0.16	0.72	0.10	0.03	0.12	0.03	0.82	0.09	0.03	0.05	0.01
Talbot	16	0.38	0.13	0.13	0.25	0.13	0.88	0.05	0.03	0.04	0.00	0.93	0.03	0.02	0.01	0.01
Washington	96	0.18	0.28	0.08	0.38	0.08	0.67	0.14	0.02	0.15	0.02	0.84	0.06	0.02	0.06	0.02
Wicomico	73	0.15	0.11	0.12	0.56	0.05	0.68	0.06	0.05	0.20	0.01	0.80	0.04	0.05	0.10	0.01
Worcester	36	0.33	0.25	0.00	0.36	0.06	0.79	0.10	0.02	0.08	0.01	0.87	0.07	0.02	0.03	0.01
Baltimore City	1285	0.06	0.41	0.12	0.16	0.25	0.43	0.30	0.11	0.08	0.08	0.61	0.16	0.13	0.04	0.06

Notes: "Regular" cases are those that received a "regular" monthly food stamp disbursement on the 5th, 6th, or 7th of both September and October.

* Convenience Stores include the "grocery and gas combination" category and the "combination grocery & merchandise" category

** Metro counties are counties in SMSAs; Baltimore City is excluded from this group and shown separately. Categories do not sum to total since some cases had county missing.

Rather than due to a lack of supermarkets, food stamp recipients' relatively low use of supermarkets in Baltimore City appears to be due to a high availability of small and medium grocery stores and specialty food stores. There are 7.31 grocery stores per 10,000 residents in Baltimore City, *versus* 1.59 grocery stores per 10,000 residents in non-metro counties and only 0.53 grocery stores per 10,000 residents in metro counties. This relative availability correlates with use. Compared to food stamp recipients outside Baltimore City, those in Baltimore City spend four times the amount of food stamp dollars in small and medium grocery stores. The relative number (and use) of specialty food stores is also much higher in Baltimore City than elsewhere in the state.

Interestingly, although the perceived lack of supermarkets in inner cities has—almost as a corollary—led to concerns about recipients' use of higher-priced convenience stores, food stamp recipients in Baltimore City shop in convenience stores less frequently, and spend relatively fewer benefit dollars, than recipients elsewhere in the state.

An additional dimension of shopping behavior is the number of *different* retailers accessed by a household during the month. Table 2.6 shows that food stamp recipients shopped at an average of nearly five different stores during September 1993; only 14 percent of cases shopped exclusively at a single retailer. Food stamp recipients in Baltimore City shopped at nearly twice as many different stores than recipients in other areas.

Access to food stores is typically defined by locational proximity, but another important dimension of access may be hours of operation. In fact, Figure 2.5 shows that the retailers that do not specialize in staple foods (convenience stores, combination grocery and gas, and other combinations) are disproportionately accessed by food stamp recipients during "off-peak" hours.

Thus, a story that is consistent with the data is not one of inner-city residents shopping at the corner convenience store (except maybe late at night), but of inner-city residents making many small transactions at several different stores. Furthermore, at least on a city-wide scale, access to supermarkets does not appear to be a problem. It is still possible, of course, that supermarkets in Baltimore City are not located in or near food stamp recipients' neighborhoods. If so, and if

TABLE 2.6
NUMBER AND TYPES OF STORES ACCESSED FOR FOOD STAMP REDEMPTION
SEPTEMBER 1993

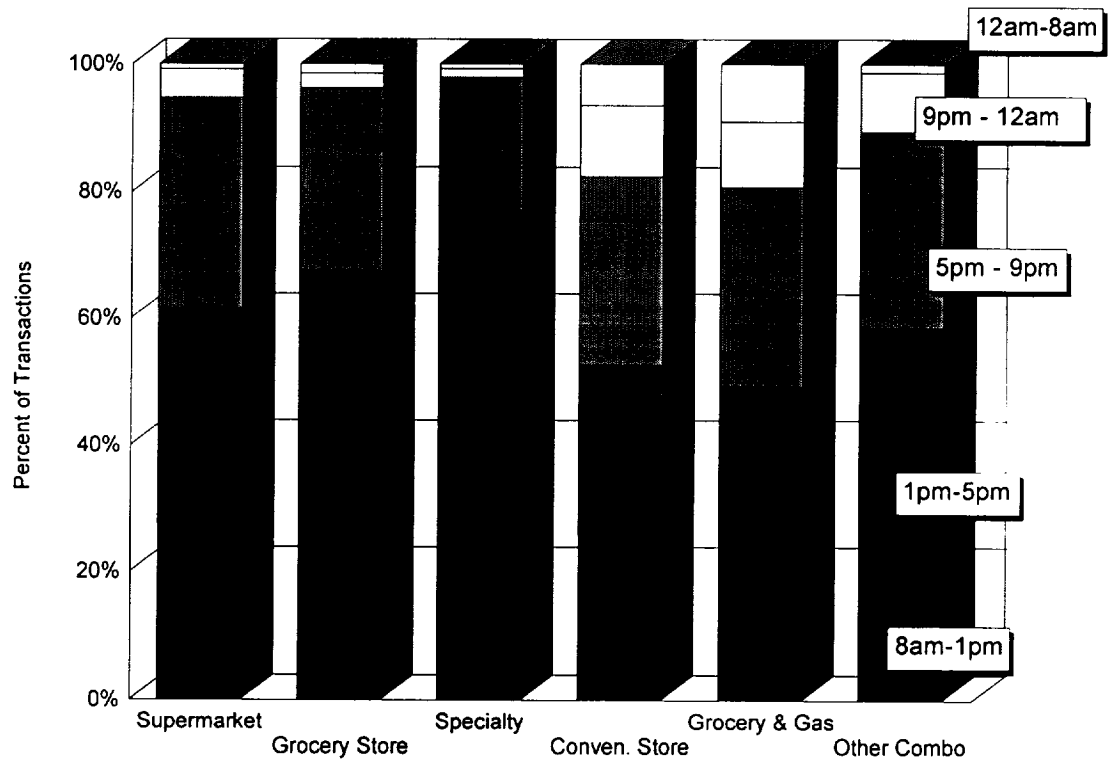
	"Regular" Food Stamp Cases	Avg # of Different Stores Shopped	Fraction of cases shopping at:				Fraction of cases shopping exclusively at:		
			One Store	2-3 Stores	4-5 Stores	Six+ Stores	Super- markets	Grocery Stores	Conv. Stores*
State Total	129,594	4.54	0.14	0.32	0.25	0.29	0.28	0.01	0.00
Non-Metro Counties	11,051	3.05	0.24	0.42	0.23	0.11	0.44	0.01	0.08
Metro Counties**	52,809	3.50	0.18	0.39	0.26	0.16	0.43	0.01	0.00
Baltimore City	65,721	5.62	0.09	0.24	0.25	0.43	0.13	0.02	0.00
County:									
Allegany	3,034	3.53	0.21	0.36	0.26	0.18	0.34	0.02	0.01
Anne Arundel	5,476	3.55	0.17	0.40	0.26	0.17	0.38	0.01	0.00
Baltimore	10,524	3.76	0.17	0.37	0.26	0.20	0.43	0.00	0.00
Calvert	820	3.25	0.21	0.41	0.25	0.13	0.26	0.06	0.00
Caroline	577	2.89	0.26	0.43	0.23	0.08	0.49	0.01	0.01
Carroll	1,016	2.64	0.30	0.44	0.20	0.06	0.60	0.00	0.01
Cecil	1,754	2.69	0.28	0.46	0.21	0.06	0.46	0.01	0.01
Charles	2,114	3.56	0.16	0.40	0.27	0.17	0.34	0.01	0.00
Dorchester	1,157	3.23	0.24	0.38	0.26	0.14	0.39	0.04	0.00
Frederick	1,841	2.69	0.28	0.47	0.19	0.06	0.72	0.00	0.00
Garrett	950	2.96	0.20	0.47	0.27	0.07	0.37	0.01	0.01
Harford	2,489	3.32	0.22	0.39	0.25	0.14	0.47	0.01	0.01
Howard	1,285	3.07	0.23	0.46	0.19	0.12	0.56	0.01	0.00
Kent	339	2.14	0.42	0.43	0.13	0.03	0.66	0.01	0.01
Montgomery	7,617	3.30	0.21	0.40	0.24	0.14	0.55	0.01	0.00
Prince George's	13,575	3.66	0.14	0.40	0.29	0.17	0.36	0.00	0.00
Queen Anne's	429	2.60	0.33	0.42	0.19	0.06	0.60	0.01	0.00
St Mary's	1,519	3.31	0.21	0.41	0.26	0.13	0.44	0.02	0.00
Somerset	910	3.17	0.23	0.41	0.24	0.12	0.36	0.02	0.01
Talbot	665	2.52	0.30	0.47	0.19	0.04	0.69	0.01	0.00
Washington	2,589	3.56	0.18	0.37	0.28	0.17	0.37	0.01	0.01
Wicomico	2,212	3.48	0.21	0.38	0.24	0.17	0.37	0.01	0.02
Worcester	968	2.88	0.26	0.43	0.23	0.08	0.52	0.01	0.00
Baltimore City	65,721	5.62	0.09	0.24	0.25	0.43	0.13	0.02	0.00

Notes: "Regular" cases are those that received a "regular" monthly food stamp disbursement on the 5th, 6th, or 7th of both September and October.

* Convenience Stores include the "grocery and gas combination" category and the "combination grocery & merchandise" category

** Metro counties are counties in SMSAs. Baltimore City is excluded by this group and shown separately. Categories do not sum to total since some cases had county missing.

Figure 2.5
PERCENT OF FOOD STAMP TRANSACTIONS



grocery stores and specialty stores charge higher prices than supermarkets, then lack of ready access to supermarkets remains a problem for food stamp recipients.

Benefit Exhaustion

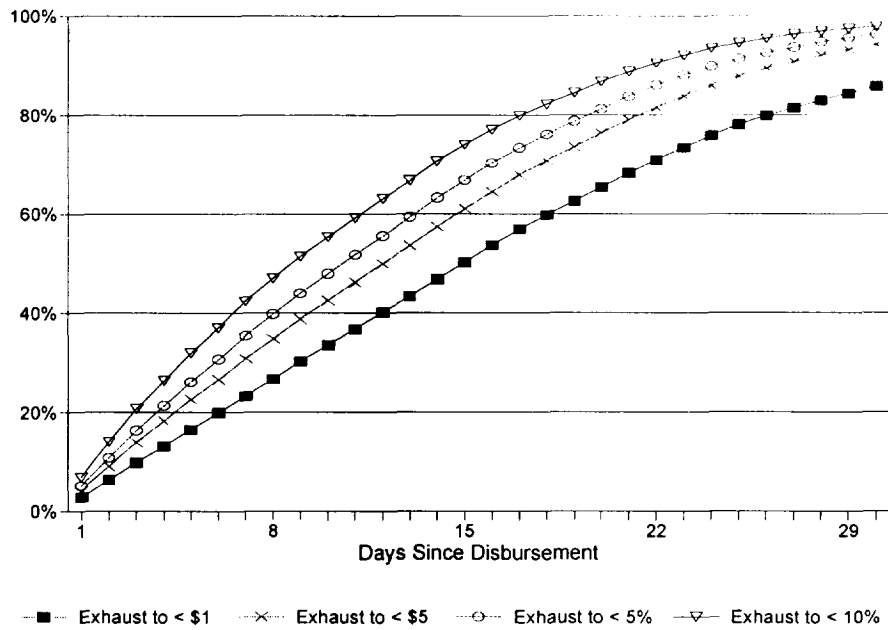
Food stamp benefits are disbursed on a monthly basis. This fact has several implications for both the recipients of food stamp benefits and evaluators of the FSP. As was seen in Table 2.1, recipients redeem their food stamp benefits quickly following disbursement. The average recipient redeems more than half of his or her disbursement within the first week. This evidence suggests that a monthly disbursement begets monthly spending of food stamp benefits. Food stamp spending patterns do not, however, necessarily reflect recipients' *overall* food shopping patterns. Available survey evidence, though dated, shows that food stamps comprise less than 50 percent of recipients' total food budget for 53 percent of food stamp households; only 14 percent of food stamp households rely on food stamps for more than 90 percent of their food purchases.¹⁷

The fact that more than half of all food stamp benefits are redeemed in the week following disbursement leads us to ask if nearly all recipients spend half of their benefits in the first week, or conversely, if a significant number of recipients completely exhaust their benefits in the first week whereas the remainder spread their redemptions throughout the month. Figure 2.6 shows the cumulative percent of cases exhausting their benefits by days since disbursement, according to various definitions of "exhaustion." On each day since disbursement, the percentage of cases reaching exhaustion increases at a slightly decreasing rate. By the end of the first week, only a little more than 20 percent of all cases have completely exhausted their benefits (i.e., less than \$1 in benefits remains), though 35 percent have exhausted at least 95 percent of their benefits.

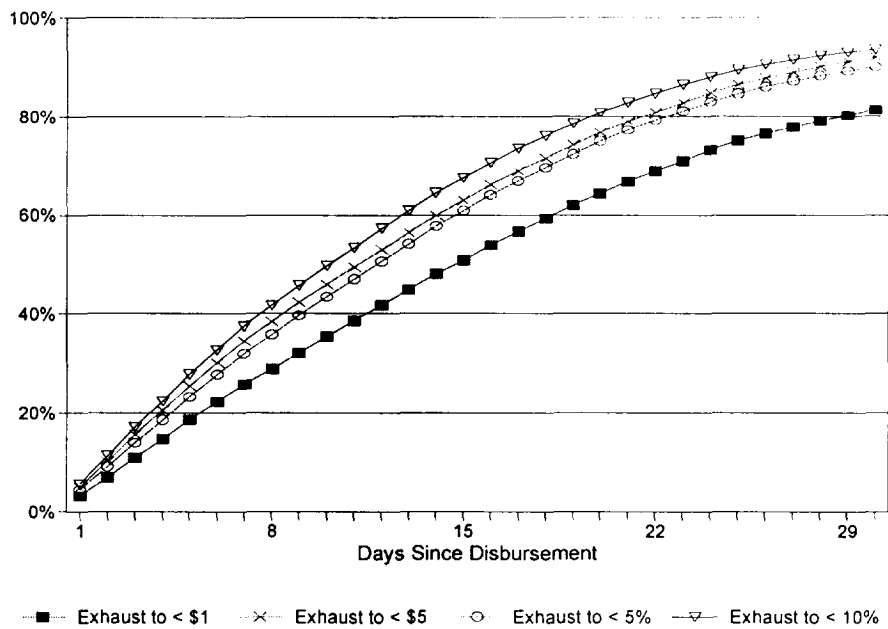
Figure 2.7 shows cumulative exhaustion by allotment size. This figure shows that exhaustion of benefits early in the month is disproportionately due to the exhaustion of benefits by recipients with the smallest monthly allotments (less than \$200). Only about 20 percent of

17. Ohls, James C. and Harold Beebout, *The Food Stamp Program: Design, Tradeoffs, Policy, and Impacts*. Washington, DC: The Urban Institute Press, 1994. The cited statistics are based on tabulations of the 1979-80 Low-Income Supplement to the 1977-78 Nationwide Food Consumption Survey.

Figure 2.6
Cumulative Percent of Cases "Exhausted"
Food Stamp and Cash Benefit Cases (PA)



Food Stamp Only Cases (NPA)



recipients in the three largest allotment categories have exhausted their benefits by the end of week one, compared to 30 to 50 percent of recipients with smaller allotments.

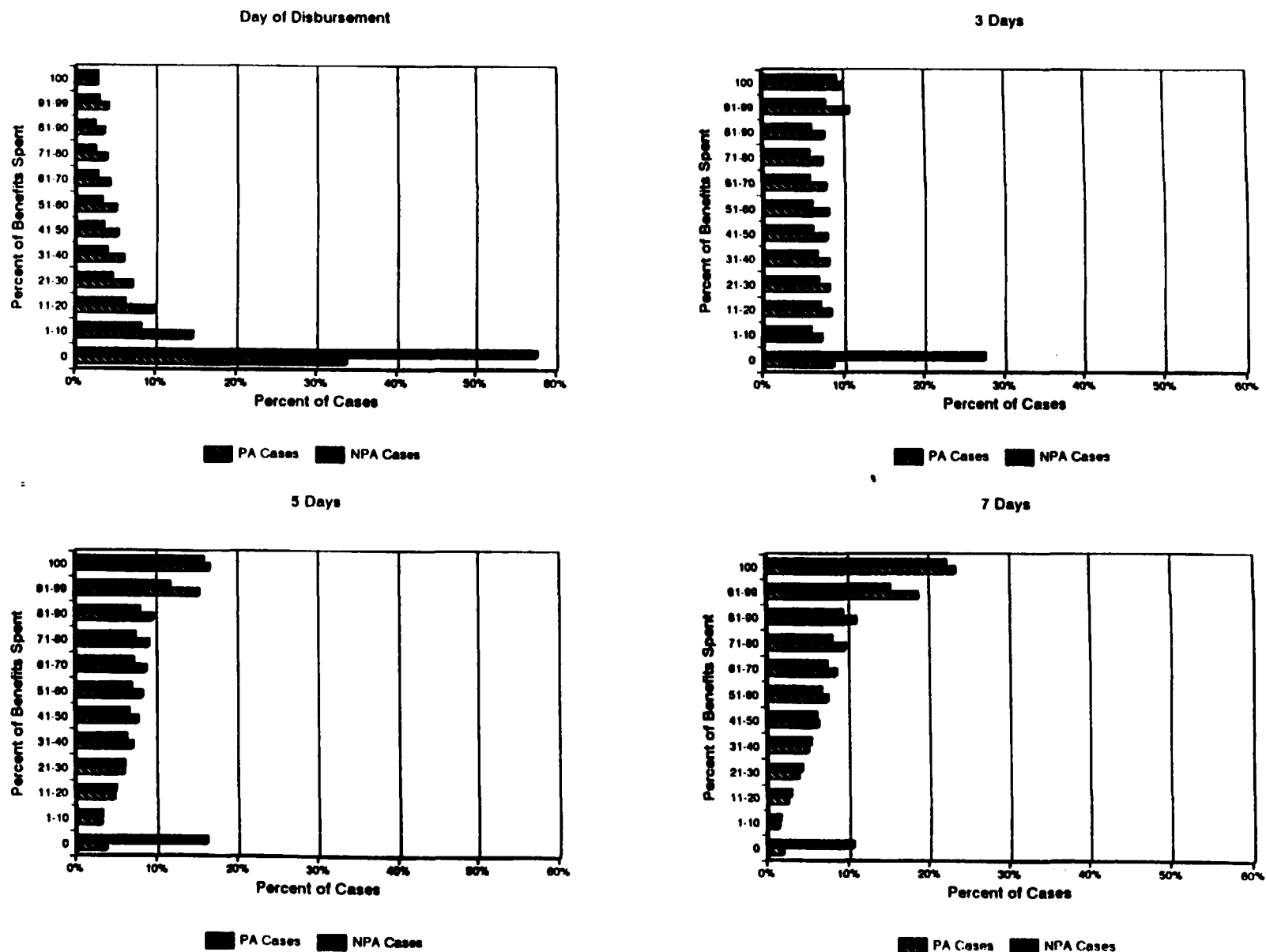
The graph in Figure 2.7 tells us how quickly recipients spend *all* of their benefits, but it does not address the question of how benefit redemption is spread throughout the month. Figure 2.8 shows the distribution of the cumulative percent of benefits spent on each of several days following disbursement. This graph shows that a surprisingly large 58 percent of all NPA food stamp cases do not redeem *any* benefits on the day of disbursement; only 32 percent of PA cases do not redeem benefits on day one. By the seventh day, over 35 percent of both PA and NPA cases have spent at least 90 percent of their benefits (consistent with Figure 2.6); however, this graph additionally shows that a majority of cases have redeemed at least 50 percent of their benefits by the end of week one. This evidence is consistent with the hypothesis that food stamp recipients make major food purchases on a monthly, rather than weekly, basis.

If food stamp recipients shop on a monthly basis, one of the obvious implications is that it may be very difficult to rely on survey methods to collect the same types of information from the food stamp population that we have assembled here from the EBT transactions log. For example, questions about "last week" will contain a high degree of sampling variance according to variance in the timing of the interview relative to disbursement. A possible solution is for surveys to use "last month" as a reference period, but this introduces an unknown amount of recall error.

Appendix B compares survey responses from a sample of Maryland EBT food stamp recipients to the actual redemption behavior of these respondents, as logged on the EBT system. Unfortunately, the survey was conducted over a period of several months (each respondent was interviewed once during the period from May to October 1993), and the transactions log references the September disbursement month. The comparison is therefore not ideal, but it does shed some light on the issue of survey reliability. The appendix examines items such as:

- In a typical month how often do you shop?
- One week after you receive your food stamp benefits, how much do you have left?
- In what type of store do you spend the majority of your food stamp benefits?

Figure 2.8
Speed of Food Stamp Benefit Exhaustion By Days Since Disbursement
Percent of Cases According to Percent of Benefits Redeemed



The results show that, on average, there is little difference in the redemption behaviors of groups that *report* very different behaviors.

Benefit Carryover

Food stamp recipients redeem their benefits quickly following disbursement, yet a significant number of cases do not exhaust completely. This may be because it is not worth the effort of using the EBT card to redeem small amounts when those funds may accumulate without penalty. In this section we examine the magnitude of funds that remain unredeemed at month's end.

Table 2.7 shows the percent of cases who "carry-over" any benefits and the mean dollar amount carried over. The percent of cases with carryover is measured in two ways. First we measure the percent of cases with a food stamp balance greater than \$1 on the day prior to the October disbursement ("Defn #1" in the table). This is a "long-term" measure, because the end balance reflects any carryover from the previous month. The second measure (Defn #2) defines carryover as the difference between the current month's disbursement and redemptions—thereby measuring only the carryover that would occur if all cases started the month with a zero balance.¹⁸

Nearly 40 percent of NPA food stamp cases and 30 percent of PA food stamp cases had more than \$1 of benefits remaining in their account just prior to the October disbursement of benefits. For both groups, the average carryover was about \$24. Although this average is pushed upward by those cases that did not access any benefits in September, the average carryover for the remaining cases is still sizeable—about \$20.

As might be expected, the average dollar amount of carryover generally increases for recipients with larger monthly allotments (especially when groups with small numbers of recipient are excluded). For any given allotment-size group, NPA food stamp recipients generally have more benefits left over at the end of the month than PA food stamp cases. (The overall PA and NPA means are similar only because of different distributions in allotment size.)

18. The latter measure was used to examine benefit exhaustion in the previous section.

Table 2.7
FOOD STAMP BENEFITS CARRIED OVER TO NEXT DISBURSEMENT MONTH
By Case Type, Location, and Allotment Size*

	Food Stamp Only Cases				Food Stamp & Cash Assistance Cases			
	Caseload	Fraction of Cases Ending Month with Balance > \$1		Avg End Balance	Caseload	Fraction of Cases Ending Month with Balance > \$1		Avg End Balance
		Defn #1	Defn #2			Defn #1	Defn #2	
State Total	53,960	0.387	0.232	24.35	79,334	0.288	0.189	23.18
Non-Metro Counties								
Total	6,905	0.457	0.274	21.90	4,592	0.397	0.247	21.62
<i>By Allotment Size:</i>								
\$10	616	0.435	0.242	6.85	5	0.400	0.400	2.21
\$11-100	3,024	0.418	0.249	15.05	199	0.307	0.181	14.28
\$101-200	2,034	0.458	0.283	22.89	1,403	0.420	0.239	18.42
\$201-300	915	0.527	0.317	37.48	2,103	0.391	0.258	20.11
\$301-400	234	0.658	0.393	38.91	676	0.392	0.253	30.19
\$401-500	57	0.684	0.368	58.55	179	0.402	0.235	38.26
\$501-600	20	0.600	0.450	38.54	25	0.440	0.240	36.27
\$601+	5	0.600	0.400	31.19	2	0.500	0.500	13.20
Metro Counties								
Total	25,416	0.459	0.276	24.94	29,170	0.413	0.263	24.60
<i>By Allotment Size:</i>								
\$10	1,646	0.442	0.230	8.64	12	0.250	0.167	7.08
\$11-100	10,879	0.421	0.250	17.21	702	0.268	0.171	11.00
\$101-200	8,089	0.473	0.284	26.56	8,842	0.422	0.261	21.01
\$201-300	3,510	0.519	0.326	39.87	14,028	0.420	0.270	24.68
\$301-400	941	0.550	0.366	41.54	4,369	0.397	0.258	29.25
\$401-500	249	0.570	0.394	47.28	1,046	0.402	0.272	39.35
\$501-600	82	0.561	0.354	56.92	136	0.485	0.324	39.93
\$601+	20	0.650	0.400	73.82	35	0.486	0.371	39.40
Baltimore City								
Total	21,629	0.280	0.166	24.34	45,554	0.197	0.136	21.60
<i>By Allotment Size:</i>								
\$10	1,082	0.311	0.143	7.62	28	0.143	0.143	4.06
\$11-100	10,038	0.273	0.160	15.33	1,084	0.157	0.101	12.32
\$101-200	7,794	0.267	0.163	32.76	19,631	0.184	0.125	20.82
\$201-300	2,093	0.317	0.197	38.29	16,942	0.216	0.149	20.61
\$301-400	448	0.357	0.219	31.09	5,992	0.191	0.140	24.62
\$401-500	134	0.351	0.231	52.51	1,594	0.208	0.150	33.06
\$501-600	31	0.452	0.387	98.81	227	0.176	0.115	42.69
\$601+	9	0.111	0.111	79.18	56	0.179	0.107	19.06

Notes: Includes ALL cases with a disbursement in September, including cases with no redemption transactions

State total exceeds the sum over regions due to cases with missing county code

*The \$10 allotment group contains a small number of cases receiving \$2-9

Definition #1 = ending balance greater than \$1.

Definition #2 = disbursement for September minus total redemptions in September greater than \$1.

Average end balance is the average balance of food stamp benefits on the day prior to the October disbursement, for cases with greater than \$1 remaining (defn #1).

Out-of-State Transactions

Every EBT system implemented to date has had to address the issue of food stamp recipients *within* the system's implementation area who want to shop at stores *outside* the system's boundaries. Usually, at least a few such stores have been equipped with POS terminals capable of handling EBT transactions.

Food stamp recipients in Maryland accessed their benefits at 39 out-of-state retailers between August and October 1993.¹⁹ In the aggregate, the amount of cross-border shopping was small. These 39 stores represented about 1.2 percent of all food stores capable of handling EBT sales. Only 0.3 percent of all food stamp purchases in September 1993, however, occurred in these stores; these purchases represented 0.5 percent of all food stamp redemptions that month.

Out-of-state transactions have been included in all analyses within this chapter except those that break out redemption activity by *both* store type and location (i.e., Tables 2.4 and 2.5).

19. In order to receive the necessary POS terminals, out-of-state retailers had to request and finance the equipment. In contrast, all FSP-authorized retailers within Maryland had the option of receiving limited function (i.e., EBT-only) terminals at no cost. (In-state food retailers could also enter into contracts with the EBT system vendor for multi-function terminals that could accept commercial POS transactions as well as EBT transactions.)

CHAPTER THREE

CASH BENEFIT REDEMPTIONS

Prior to the expansion of the Maryland EBT system, cash assistance benefits were disbursed to recipients via government-issued check. Since implementation of EBT, recipients access their benefits by using an "Independence" card and PIN number to withdraw their benefits at automatic teller machines (ATM) and point-of-sale (POS) machines.²⁰ Maryland cash benefit recipients may access their benefits at any ATM machine that is part of the MOST network.²¹ Access at POS machines may be made via purchase transaction, cash-back transaction, or combination purchase and cash-back transaction.

An obvious question is, "Why do we care about the pattern of benefit redemption for cash benefits?" Unlike the FSP, which issues an in-kind benefit for a particular targeted consumption outcome, cash assistance has "no strings attached" in terms of the use of benefits. As mentioned in the Introduction, however, a large part of the reason for examining benefit redemption is to gain information about the transactions demand patterns of the cash benefit caseload.

There are two considerations with respect to transactions demand: first, by examining the frequency and timing of redemption activity, we learn about the necessary capacity of an EBT system serving a welfare caseload. Second, by examining the case-level variation in transactions activity, we learn more about the cost considerations of transferring benefit issuance to EBT.

The evaluation of the expansion of the Maryland EBT system found that EBT was not cost-neutral for the cash-assistance programs.²² That is, the EBT issuance system is more costly than the paper system of check-issuance that it supplanted. The main component of the increased cost is the ATM fee for cash withdrawals; the driving force behind the cost of ATM fees is the

20. A small number of recipients receive their benefits via direct deposit to their bank account.

21. This includes MOST ATMs inside and outside of the state of Maryland.

22. Logan *et al.*, "The Evaluation of the Expanded EBT Demonstration in Maryland, Volume 2: System Impacts on Program Costs and Integrity," Abt Associates Inc., Cambridge, MA, May 1994.

number of transactions made per recipient. Recall that in a check-issuance system, the state incurs the cost of issuing checks but not the cost of check-cashing. In an EBT system, the state incurs the fee cost for the ATM transactions that give recipients access to their cash benefits. Hence, the mix of ATM *versus* POS transactions and the number of ATM transactions per case have important cost implications for EBT issuance. Yet it is hard to know the extent to which the Maryland cost-benefit results may be generalized to other regions of the country. For example, do the number of transactions per case vary with the mix of the caseload? With the availability of ATM machines? With the size of allotment? Do multiple transactions per case represent distinctly separate transaction occasions, or nearly simultaneous withdrawals—i.e., is there a reasonable chance for reducing the number of transactions per case through better training of recipients in the use of ATM machines? This chapter addresses some of these questions.

Caseload Composition

The EBT system serves nearly all beneficiaries of cash public assistance in Maryland. For the most part, this includes recipients of AFDC and DALP.²³ Only a very small number of recipients of Public Assistance for Adults (PAA) were in the EBT system in September 1993, because only a few local offices of the Maryland Department of Social Services placed their PAA caseloads on EBT. PAA is a very small program relative to AFDC and DALP, however. In addition to the public assistance programs, the NPA Child Support (NPACS) caseload of Baltimore City was part of the EBT system in 1993.

Table 3.1 shows the composition of the Maryland cash assistance caseload in September 1993. As seen in the table, the AFDC caseload accounts for 86 percent of the cash assistance caseload and 91 percent of cash benefit disbursements outside of Baltimore City.²⁴ The caseload composition is quite different in Baltimore City, with the AFDC caseload accounting for 67 percent of all cases and 79 percent of all disbursements. The difference is due to the much larger

23. The Disability Assistance Loan Program (DALP) was called General Public Assistance (GPA) prior to December 1992.

24. In all tables we group the PAA cases together with the DALP cases, because there were only 78 PAA cases on the system in September 1993.

Table 3.1
THE CASH BENEFIT CASELOAD IN MARYLAND
September 1993

	State Total	Non-Metro Counties	Metro Counties	Baltimore City
Total Caseload	104,180	6,517	39,506	58,119
<i>Percent by Program</i>				
AFDC	75.63%	86.31%	86.88%	66.79%
AFDC-Unemployed Parents	0.83%	2.12%	1.50%	0.23%
Disability Assistance Loan Program*	19.75%	9.81%	10.91%	26.88%
Child Support Bonus Only	0.56%	1.76%	0.71%	0.31%
NPA-Child Support	3.23%	NA	0.01%	5.78%
Percent of AFDC cases with Child Support Bonus	16.24%	30.56%	17.26%	13.29%
Total Disbursements	30,443,818	1,983,941	12,306,900	16,170,069
<i>Percent by Program</i>				
AFDC	85.03%	91.12%	91.28%	79.37%
AFDC-Unemployed Parents	1.23%	2.85%	2.10%	0.38%
Disability Assistance Loan Program	11.60%	5.73%	6.49%	16.19%
Child Support Bonus	0.10%	0.30%	0.12%	0.06%
NPA-Child Support	2.13%	NA	0.01%	4.00%
Average Disbursement				
AFDC	328.55	321.37	327.32	330.63
AFDC-Unemployed Parents	434.45	409.11	437.74	445.89
Disability Assistance Loan Program	171.63	178.02	185.26	167.60
Child Support Bonus Only	51.37	52.35	51.21	51.01
NPA-Child Support	192.80	NA	419.56	192.67
Percent receiving Food Stamps				
<i>Overall</i>	84.60%	78.38%	80.62%	88.22%
AFDC	85.63%	79.86%	81.75%	89.89%
AFDC-Unemployed Parents	93.18%	88.41%	93.40%	97.06%
Disability Assistance Loan Program	81.31%	67.14%	72.36%	84.38%
Child Support Bonus Only	48.19%	56.52%	41.94%	53.30%

Note: Table reflects entire caseload and is not limited to cases receiving "regular" disbursements.

Regions do not sum to state total because 38 cases are missing county code.

The average Child Support Bonus exceeds \$50 due to the occurrence of multiple receipts by some cases.

* Disability Assistance Loan Program (DALP) includes 78 Public Assistance for Adults (PAA) cases.

DALP caseload in Baltimore City. As with the food stamp caseload, Baltimore City accounts for more than 50 percent of the entire cash benefit caseload, which means that aggregate redemption statistics are heavily dominated by the behavior of Baltimore City recipients.

The NPACS cases of Baltimore City receive their payments via EBT, but these payments are not disbursed on a regular schedule, so we do not include these cases in the analysis of frequency and timing of transactions.²⁵ A small percent of the caseload received only the child support bonus; these are probably cases that recently left the AFDC caseload.

Some important characteristics of the caseload are the average disbursement amount, the percent of the AFDC caseload that receives the bonus child support payment, and the percent of the caseload that receives food stamps. The average disbursement amount may increase the number of transactions per case; receipt of the bonus will certainly increase the number of transactions, because the bonus is not disbursed concurrent with the AFDC payment. Receipt of food stamps may increase the percent of cash benefit withdrawals made at POS machines, relative to ATMs, because food stamp recipients are familiar with the POS machines.

Table 3.1 shows that 16 percent of the AFDC caseload receives the bonus child support payment; this varies from 31 percent of AFDC cases in non-metro counties to only 13 percent of AFDC cases in Baltimore City. The percent of cash assistance cases receiving food stamps varies from 78 percent in non-metro counties to 88 percent in Baltimore City.

All remaining tables and graphs presented in this chapter are based on the sample of cash benefit cases with a "regular" monthly disbursement. These are cases that received a disbursement on one of the "regular" disbursement days (the first, second, or third of the month) in both September and October. As discussed earlier in this report, we limit our analysis sample to these "regular" cases so as to get a clearer picture of redemption behavior relative to the time since disbursement.²⁶

25. NPACS recipients receive disbursements after the state receives a payment from the absent parent. This means that the timing of disbursements is highly variable and that multiple disbursements may occur each month, depending on both the payment schedule and the compliance of the absent parent.

26. Consistent with the food stamp sample definition, we exclude cases that received a disbursement but made no cash withdrawal transactions in September. These cases account for less than 2 percent of cases receiving a regular disbursement.

Timing and Frequency of Cash Redemptions

Recipients of cash assistance may redeem, or access, their benefits in any of four different ways in the Maryland EBT system:

- (1) withdrawal of cash at any participating ATM (which includes all ATMs in the MOST network);
- (2) receipt of "cash-back" from any EBT-equipped retailer (food or non-food) who agrees to provide cash to recipients using their EBT card;
- (3) purchase of goods at any EBT-equipped retailer (food or non-food); and
- (4) a combination purchase and cash-back at any retailer agreeing to provide cash-back.

The transactions log data do not allow one to distinguish among the latter three types of transactions. This means that we cannot separately identify cash assistance recipients' EBT *withdrawals* from their EBT *purchases*. Thus, even though we often refer to cash "withdrawals" in this chapter, we note that this term is broadly defined to include all four types of possible redemption transactions.

Figures 3.1 and 3.2 show the main characteristics of cash redemptions. An overwhelming majority of transactions occur on the day of disbursement (this is spread over three calendar days in the top panel and concentrated on "day one since disbursement" in the lower panel); after falling dramatically, the number of transactions peaks again on the 21st of the month when the child support bonus is disbursed. Figure 3.2 shows the average withdrawal amount dropping sharply after the day of disbursement, hovering for a few days at \$40 for AFDC cases, and then staying near \$20 for both AFDC and DALP cases. The AFDC average withdrawal amount rises slightly on the 19th to 21st days since disbursement, when the child support bonus is disbursed.

The lower panel of Figure 3.2 shows the percent of transactions that occur at ATMs (versus POS machines). Over the entire month, 53 percent of all cash benefit redemptions occur at ATMs: 56 percent for AFDC cases, and 44 percent for DALP cases. The overall percent of transactions at ATMs peaks at 67 percent on the day of disbursement, falls throughout the month

Figure 3.1
VOLUME OF CASH BENEFIT WITHDRAWALS
AFDC & DALP CASES WITH "REGULAR" MONTHLY DISBURSEMENT
SEPTEMBER 1993

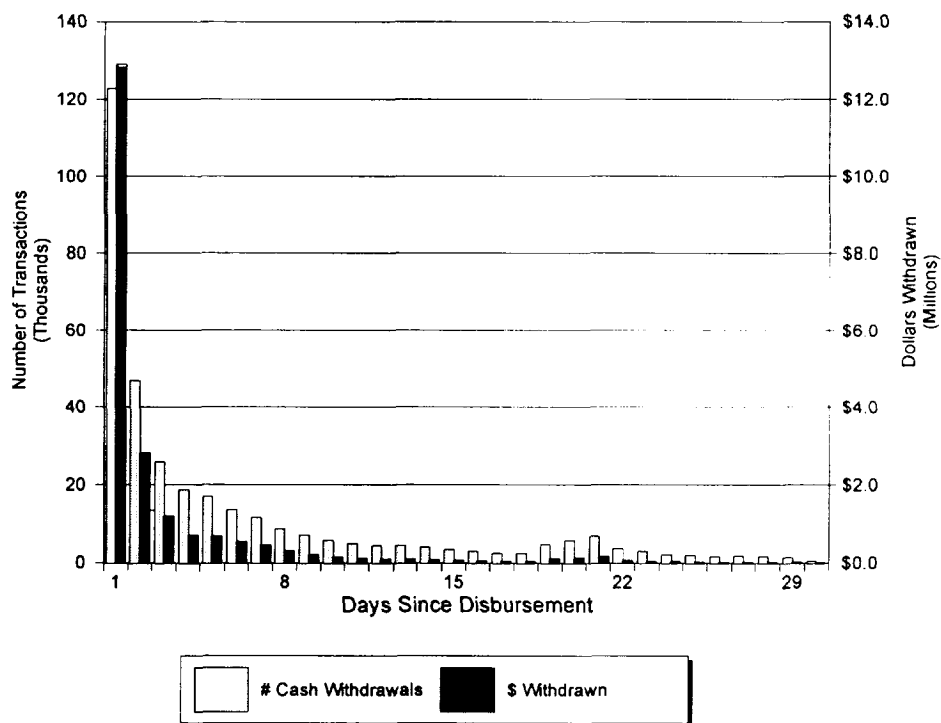
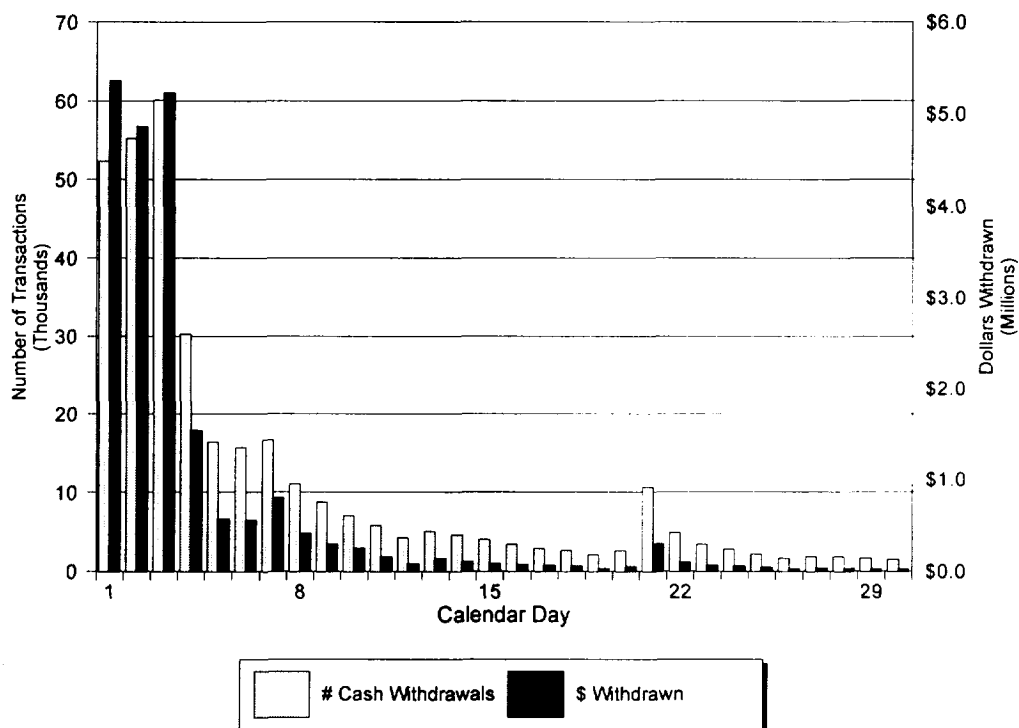
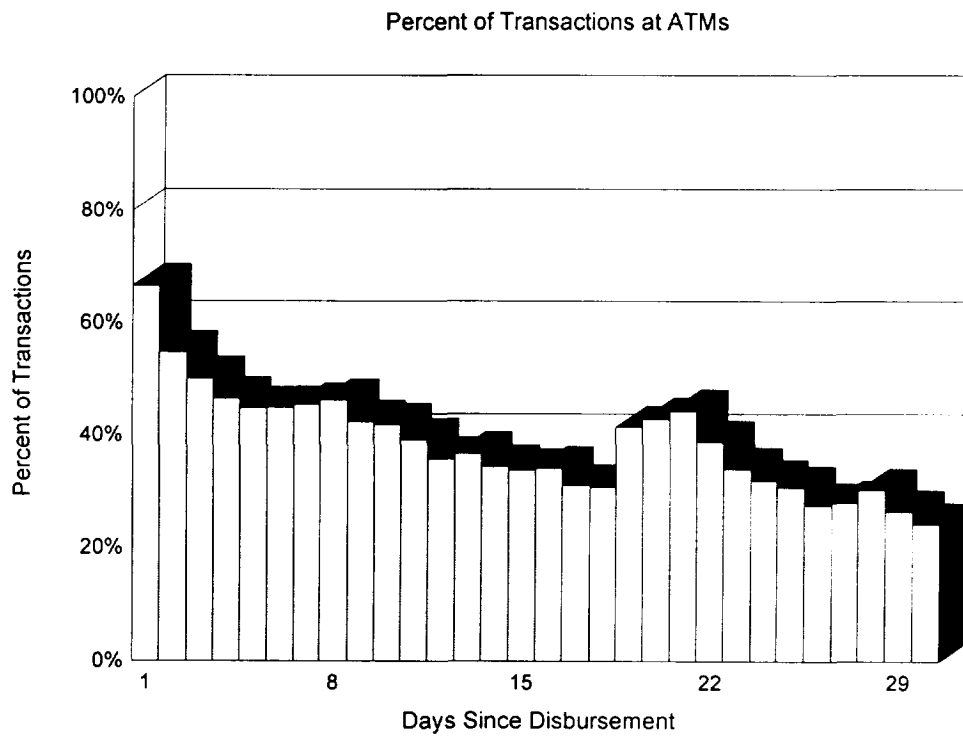
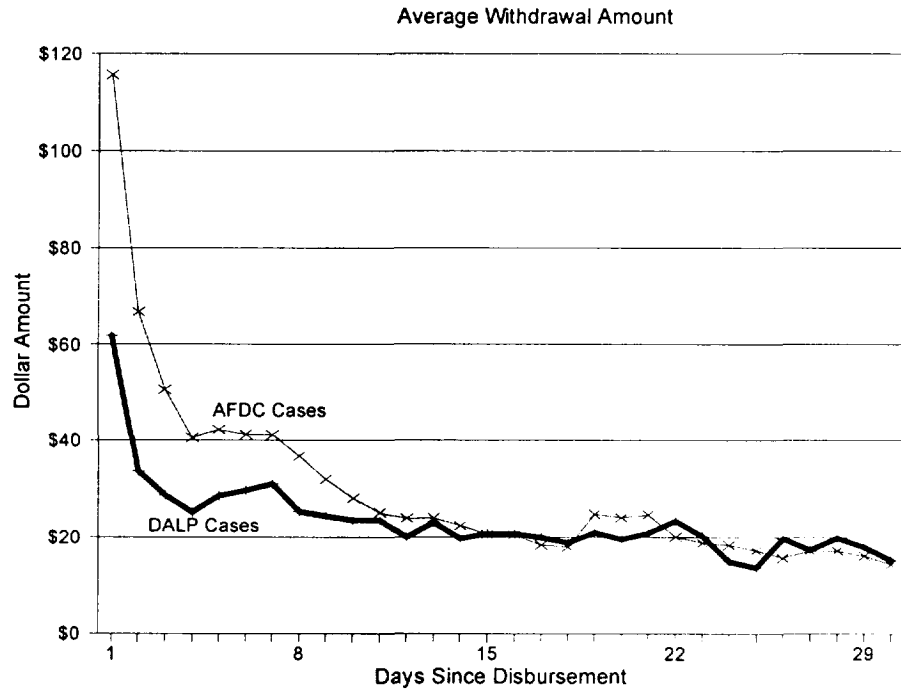


Figure 3.2
CASH BENEFIT WITHDRAWALS
AFDC & DALP CASES WITH "REGULAR" MONTHLY DISBURSEMENT
SEPTEMBER 1993



to 31 percent on day 18, and then rises again to 44 percent when the child support bonus is disbursed.²⁷

Table 3.2 presents the main characteristics of cash benefit redemption; these characteristics are shown separately for AFDC and DALP cases, and by area of residence (i.e., metro, non-metro, or Baltimore City).²⁸ On average, recipients make 4.65 redemption transactions per month, or 1.77 transactions per \$100 of benefits.²⁹ The average withdrawal amount is just under \$100, and is equal to about one-third of the average benefit amount. In the aggregate, 61 percent of all benefits are redeemed on the day of disbursement, and 91 percent are redeemed by the end of the first week in the disbursement month.

There is some variation in the above characteristics by case type and region. For example, AFDC cases make more transactions per case and fewer transactions per \$100 of benefits; this reflects the fact that, on average, AFDC benefits are twice as large as DALP benefits.

AFDC and DALP cases exhaust benefits at about the same speed.³⁰ Recipients in Baltimore County make about one more transaction per case than recipients elsewhere, and more transactions per \$100 of benefits.

27. The child support bonus is disbursed to nearly all cases on the 21st of the month. Because AFDC disbursements are staggered over a three-day period, however, the child support bonus appears staggered on a "days since disbursement" timeline.

28. Analogous tables with county-level information appear in Appendix D.

29. Recall that cash benefit recipients may withdraw cash at ATMs or use POS machines for purchases, cash-back, or combination purchase and cash-back transactions. By "redemption" or "transaction" we refer to any of transaction resulting in a debit from the account. Balance inquiry transactions are not included in this analysis.

30. The child support bonus is not included in the "total benefit amount" for the purpose of calculating the timing of benefit exhaustion.

Table 3.2
CASH BENEFIT REDEMPTION IN MARYLAND
SEPTEMBER 1993

	Caseload	Total Issuances	Average Benefits	Total Withdrawal Transactions	Average Withdrawal Amount	Avg # Transactions		Aggregate fraction of benefits redeemed by:			
						per case	per \$100 allot.	Day 1	Day 2	Day 3	Day 7
Total "Regular" Cases	74,457	21,585,161	289.90	346,355	99.71	4.65	1.77	0.61	0.74	0.80	0.91
AFDC Cases with "Regular" Monthly Disbursement											
Non-Metro Counties	3,909	1,264,063	323.37	18,262	96.88	4.67	1.65	0.57	0.70	0.78	0.89
Metro Counties	25,636	8,281,274	323.03	110,486	111.61	4.31	1.45	0.55	0.69	0.76	0.89
Baltimore City	29,303	9,537,587	325.48	158,164	103.75	5.40	1.82	0.66	0.78	0.83	0.93
Total AFDC	58,848	19,082,924	324.27	286,912	106.76	4.88	1.65	0.60	0.74	0.80	0.91
DALP Cases with "Regular" Monthly Disbursement											
Non-Metro Counties	467	75,744	162.19	1,414	77.82	3.04	1.95	0.46	0.61	0.70	0.85
Metro Counties	3,167	535,750	169.17	9,956	83.41	3.16	1.91	0.46	0.60	0.68	0.86
Baltimore City	11,954	1,883,734	157.58	47,959	70.12	4.02	2.55	0.68	0.81	0.85	0.95
Total DALP	15,588	2,495,229	160.07	59,329	73.05	3.82	2.41	0.63	0.76	0.81	0.92

Notes: Regions do not sum to total due to 21 cases with missing county code.

The average number of transactions per \$100 allotment is calculated first per case and then averaged over cases.

Number of "withdrawal" transactions include POS transactions that may be purchase only, purchase and cash-back, or cash-back only transactions.

Location of Cash Redemptions

Table 3.3 shows the total number of cash benefit *redemption locations* in the state of Maryland and by region; the percent of locations that are ATMs; and the distribution of redemption activity at ATM versus POS locations. The count of redemption (or withdrawal) locations is equal to the number of FSP-authorized retailers (i.e., the number of POS locations) plus the number of ATM locations. Note that we count locations and not terminals.³¹ Overall, 35 percent of cash withdrawal locations are ATMs, though this varies considerably by region.

Fifty-three percent of all cash benefit transactions occur at ATMs and 74 percent of dollars are withdrawn from ATMs. The average recipient makes nearly the same number of transactions at ATMs and POS terminals, but this is driven largely by the number of POS transactions by recipients in Baltimore City. Outside of Baltimore City, recipients make nearly twice as many ATM transactions as POS transactions per month. Likewise, the overall percent of recipients that exclusively use ATMs (16 percent) is not very different from the percent that exclusively use POS machines (20 percent). Outside of Baltimore City, however, 29 percent of recipients exclusively use ATMs, whereas only 10 percent exclusively use POS machines (i.e., never use ATMs).

The relative use of ATM versus POS machines varies somewhat according to whether cash benefit recipients also receive food stamps. This would be expected if food stamp recipients find it efficient to withdraw their cash benefits when making food stamp transactions, or if their cash transactions are influenced by their familiarity with the POS terminals. On the other hand, food stamp disbursements occur four days after cash benefit disbursements, so that for most recipients of both cash benefits and food stamps, there may be little overlap in the timing of

31. We did not have an independent source of the number of ATM terminals or locations in the state of Maryland, and therefore relied on the EBT transactions log for this information. Our count of ATM locations is thus a count of ATMs that were actually accessed by the welfare caseload. We thus may have undercounted the total number of ATM locations available to the caseload (we have no way of counting ATM terminals at which no transactions occurred during the time period under study). In order to minimize the undercount, we used the entire transactions log that we received from Deluxe (transactions records from August 5, 1993 through October 31, 1993) to obtain a list of all ATM terminals accessed by the caseload during that three-month period. The number of ATM locations reflected in Table 3.3 is a count of unique street addresses for all ATM terminals.

redemption of these two types of benefits. In fact, we compared cash recipients who receive food stamps to those without food stamps, and found the following:

<u>Caseload</u>	<u>Percent of Cash Transactions at ATMS</u>	<u>Percent of Dollars Withdrawn at ATMs</u>
AFDC only	64.5%	79.7%
AFDC and food stamps	54.0%	75.4%
DALP only	52.2%	70.5%
DALP and food stamp	42.0%	59.7%

The chart shows differences in ATM utilization between cash-only and cash plus food stamp cases. These differences, however, may be partly due to the fact that cash recipients who also receive food stamps have higher average cash benefit allotments than those without food stamps.

One might think that the relative use of ATM and POS machines is related to the relative availability of those machines. Table 3.3, however, shows that recipients in non-metro counties have the same *low* relative availability of ATMs as recipients of Baltimore City; yet non-metro recipients utilize ATMs in the same way that recipients of metro counties use ATMs (making over 60 percent of their transactions at ATMs). We investigate this point further in Figure 3.3, where we graph ATM utilization versus ATM availability for each Maryland county.

In Figure 3.3 each "bubble" represents a county, and the size of each bubble represents the size of the county caseload relative to the statewide total. This figure shows that the aggregate data mask a generally positive relation between the percent of withdrawal locations that are ATMs and the percent of cash transactions made at ATMs by recipients in the county. There appears to be an upper bound on ATM utilization, however. Even in counties with a very high percent of ATM locations, the percent of transactions at ATMs does not rise much above 70 percent. This

Table 3.3
CASH BENEFIT REDEMPTIONS BY LOCATION
SEPTEMBER 1993

	<u>Withdrawal Locations*</u>		<u>Fraction of All Transactions at:</u>		<u>Fraction of Amount Withdrawn from:</u>		<u>Avg Number of Transactions at:</u>		<u>Fraction of cases exclusively using:</u>		<u>Average Withdrawal Amount</u>	
	Number	Percent ATM	ATM	POS	ATM	POS	ATM	POS	ATM	POS	ATM	POS
Total	5,076	34.7%	0.53	0.47	0.74	0.26	2.46	2.19	0.16	0.20	116.91	54.18
AFDC Cases with "Regular" Monthly Disbursement												
Non-Metro Counties	459	18.3%	0.63	0.37	0.85	0.15	2.86	1.81	0.23	0.09	129.05	31.54
Metro Counties	2,881	45.2%	0.66	0.34	0.85	0.15	2.90	1.41	0.29	0.10	137.26	42.45
Baltimore City	1,660	20.2%	0.44	0.56	0.67	0.33	2.45	2.95	0.08	0.24	111.98	66.69
Total AFDC	5,000	34.4%	0.55	0.45	0.76	0.24	2.65	2.28	0.18	0.17	122.80	55.12
DALP Cases with "Regular" Monthly Disbursement												
Non-Metro Counties	459	18.3%	0.59	0.41	0.76	0.24	1.81	1.22	0.29	0.17	92.11	41.11
Metro Counties	2,881	45.2%	0.63	0.37	0.79	0.21	1.98	1.16	0.33	0.16	98.47	39.17
Baltimore City	1,660	20.2%	0.34	0.66	0.56	0.44	1.56	2.46	0.05	0.35	72.62	52.45
Total DALP	5,000	34.4%	0.41	0.59	0.61	0.39	1.63	2.21	0.11	0.30	77.42	49.95

* Number of withdrawal locations include ATM locations and POS locations. Note that we count locations and not terminals.
Total number of locations includes 37 ATM locations and 39 Maryland retailers for which we could not determine county.
Withdrawals include POS transactions that may be purchase only, purchase and cash-back, or cash-back only transactions.

access and ATM utilization suggests that the projected cost of future EBT systems must consider the existing infrastructure in determining relative utilization rates and the resulting cost of ATM fees.

In addition to showing the relative use of ATM and POS locations, Table 3.3 shows that ATMs and POS devices seem to be used for different purposes. The average withdrawal amount at ATMs is more than twice the average withdrawal amount at POS locations; outside of Baltimore City this difference is fourfold. Large cash withdrawals are made at ATMs, whereas much smaller cash-back or purchase transactions are made at POS locations; this is consistent with the pictures in Figure 3.2, which show that the percent of transactions at ATMs falls throughout the month as the average withdrawal amount falls.

Redemption Behavior by Case Type, Location, and Allotment Size

Table 3.4 shows how cash redemption behavior varies with the mix of the caseload. The mean number of cash transactions rises with allotment size, whereas the average number of transactions per \$100 allotment falls with allotment size. Comparisons between AFDC and DALP cases are informative mainly for the \$101-200 allotment group that contains the majority of DALP cases; here we see that DALP cases make significantly more transactions than AFDC cases in metro counties and Baltimore City, whereas there is no difference between DALP and AFDC cases in non-metro counties. Table 3.5 contains additional characteristics of cash transactions by case type, location, and allotment size.

Cash Benefit Exhaustion

The speed of exhaustion for cash benefits can be compared to that of food stamp benefits by comparing Figure 3.4 to Figure 2.6. It is not surprising to find that cash benefits are exhausted at a much faster rate than food stamp benefits (as evidenced by the steeper slope of the cash exhaustion curve). The differential rates of exhaustion may be explained by the fact that cash benefits are likely to be used for items like rent payments at the beginning of the month. In addition, recipients may withdraw their cash benefits from their EBT accounts prior to actually

Table 3.4
MEAN NUMBER OF CASH BENEFIT TRANSACTIONS
By Case Type, Location, and Allotment Size

		<u>Number of Cases</u>		<u>Mean Number of Transactions</u>		<u>Mean Transactions per \$100 Allotment</u>	
		AFDC	DALP	AFDC	DALP	AFDC	DALP
State Total	74,457	58,848	15,588	4.88	3.82	1.65	2.41
Non-Metro Counties							
Total		3,909	467	4.67	3.04	1.65	1.95
<i>By Allotment Size</i>							
\$1-100		80	37	2.81	2.03	5.38	2.44
\$101-200		495	396	3.02	3.03	1.99	1.93
\$201-300		1,550	23	4.40	4.09	1.62	1.96
\$301-400		1,230	3	5.22	5.67	1.47	1.80
\$401-500		391	2	5.92	4.50	1.33	1.08
\$501-600		149	1	5.74	6.00	1.09	1.03
\$601+		14	5	8.86	3.40	1.39	0.49
Metro Counties							
Total		25,636	3,167	4.31	3.16	1.45	1.91
<i>By Allotment Size</i>							
\$1-100		260	18	2.31	2.17	4.98	4.37
\$101-200		2,763	2,962	2.70	3.12	1.75	1.91
\$201-300		10,867	159	4.09	4.16	1.49	1.90
\$301-400		8,125	11	4.75	2.36	1.33	0.65
\$401-500		2,510	8	5.22	3.75	1.17	0.85
\$501-600		980	7	5.70	3.43	1.08	0.64
\$601+		131	2	6.69	5.00	1.01	0.49
Baltimore City							
Total		29,303	11,954	5.40	4.02	1.82	2.55
<i>By Allotment Size</i>							
\$1-100		340	21	2.82	3.10	8.11	4.06
\$101-200		2,704	11,756	3.42	4.01	2.24	2.55
\$201-300		11,881	177	4.92	4.86	1.82	2.32
\$301-400		9,351	0	5.88	-	1.66	-
\$401-500		3,612	0	6.56	-	1.48	-
\$501-600		1,259	0	7.65	-	1.45	-
\$601+		156	0	8.74	-	1.32	-

Notes: September disbursement month; cases with "regular" monthly disbursement.
Regions do not sum to total due to 21 cases with missing county code.
DALP = Disability Assistance Loan Program.

Table 3.5
MEAN CHARACTERISTICS OF CASH BENEFIT TRANSACTIONS
By Case Type, Location, and Allotment Size

	<u>Average Withdrawal Amount</u>		<u>Avg Fraction of Transactions at ATMs</u>		<u>Avg Fraction of Cases NEVER using ATMs</u>	
	AFDC	DALP	AFDC	DALP	AFDC	DALP
State Total	106.72	73.05	0.55	0.41	0.17	0.30
Non-Metro Counties						
Total	96.88	77.82	0.63	0.59	0.09	0.17
<i>By Allotment Size</i>						
\$1-100	32.99	56.67	0.42	0.81	0.33	0.03
\$101-200	78.53	78.64	0.67	0.56	0.12	0.19
\$201-300	96.41	68.44	0.64	0.53	0.09	0.09
\$301-400	99.44	55.82	0.61	0.82	0.09	0.00
\$401-500	111.38	101.50	0.67	0.92	0.06	0.00
\$501-600	137.50	96.67	0.64	1.00	0.07	0.00
\$601+	99.38	212.20	0.60	0.93	0.07	0.00
Metro Counties						
Total	111.61	83.41	0.66	0.63	0.10	0.16
<i>By Allotment Size</i>						
\$1-100	36.10	40.85	0.53	0.55	0.25	0.28
\$101-200	89.24	82.24	0.67	0.62	0.16	0.16
\$201-300	107.14	89.78	0.68	0.69	0.08	0.08
\$301-400	116.58	234.97	0.64	0.61	0.09	0.18
\$401-500	132.53	156.53	0.68	0.94	0.08	0.00
\$501-600	144.40	186.71	0.65	0.95	0.08	0.00
\$601+	150.97	205.83	0.69	1.00	0.07	0.00
Baltimore City						
Total	103.75	70.12	0.44	0.34	0.24	0.35
<i>By Allotment Size</i>						
\$1-100	33.60	45.49	0.28	0.26	0.48	0.52
\$101-200	78.09	70.17	0.42	0.34	0.33	0.35
\$201-300	95.38	70.09	0.46	0.46	0.22	0.14
\$301-400	110.03	-	0.43	-	0.24	-
\$401-500	125.89	-	0.44	-	0.23	-
\$501-600	138.81	-	0.43	-	0.22	-
\$601+	165.58	-	0.40	-	0.26	-

Notes: September disbursement month; cases with "regular" monthly disbursement.
DALP = Disability Assistance Loan Program.

using those benefits, whereas food stamp benefits cannot similarly be accessed and "stored" prior to use.

The differential rates of exhaustion for cash benefits and food stamp benefits is consistent with the difference in mean transactions for these cases: cash recipients make an average of five transactions per month, whereas food stamp recipients make an average of ten transactions per month. Table 3.6 shows that 28 percent of cash assistance recipients withdraw all benefits with only one or two transactions. Recipients in Baltimore City are more likely to withdraw all benefits in a single transaction than recipients in other areas of the state.

From the evidence presented so far, it is hard to tell if cash benefit recipients use their EBT accounts as bank accounts, leaving their benefits in a safe place until needed. Recipients exhaust their benefits very quickly (90 percent of aggregate disbursements is withdrawn by the end of week one), yet only 28 percent completely exhaust their benefits with one or two transactions. There are several reasons why recipients may need to make several transactions even if they exhaust their benefits within just one or two days after disbursement. First, ATM machines often impose limits on the dollar amount that may be withdrawn per transaction—thus requiring recipients to make several transactions in order to withdraw their full benefit. Second, ATM machines dispense only even dollar amounts, and typically only multiples of ten dollars. This means that recipients must visit both ATM and POS locations in order to withdraw their full benefit, and it increases the likelihood that they will carry a positive balance over to the next disbursement month.

Table 3.7 shows the "carryover" behavior of the cash assistance caseload. Nearly 24 percent of AFDC cases have a positive balance at the end of the month. The end balance, however, reflects the cumulative carryover from all past months; only half of all cases with a positive balance redeemed less than the *current* month's disbursement. Among cases with an end balance greater than \$1, the mean balance is significant. Hence, carryover behavior cannot be explained by the "even-dollar" withdrawal constraints of the ATM terminals.

Finally, in Figure 3.5, we examine the distribution of the caseload according to the *percent* of benefits withdrawn by days since disbursement. Figure 3.5 shows that on the day of

Table 3.6
CASH BENEFIT EXHAUSTION
SEPTEMBER 1993

	Avg # W/D Per Case	Fraction of cases Exhausting With:		Average Benefits	Avg Amount Withdrawn on First Transaction
		One W/D	Two W/Ds		
Total "Regular" Cases	4.65	0.14	0.14	289.90	156.30
AFDC Cases with "Regular" Monthly Disbursement					
Non-Metro Counties	4.67	0.06	0.18	323.37	168.74
Metro Counties	4.31	0.09	0.17	323.03	181.29
Baltimore City	5.40	0.15	0.11	325.48	161.03
Total AFDC	4.88	0.12	0.14	324.27	170.37
DALP Cases with "Regular" Monthly Disbursement					
Non-Metro Counties	3.03	0.18	0.25	162.19	104.80
Metro Counties	3.14	0.18	0.23	169.17	114.08
Baltimore City	4.01	0.24	0.13	157.58	100.20
Total DALP	3.81	0.23	0.15	160.07	103.15

Note: "Withdrawals" include POS transactions that may be purchase only, purchase and cash-back, or cash-back only transactions.

Exhaustion is defined as the withdrawal of the full disbursement amount.

Table 3.7
CASH ASSISTANCE BENEFITS CARRIED OVER TO NEXT DISBURSEMENT MONTH
By Case Type, Location, and Allotment Size

	AFDC Cases				DALP Cases			
	Caseload	Fraction of Cases Ending Month with Balance > \$1		Avg End Balance	Caseload	Fraction of Cases Ending Month with Balance > \$1		Avg End Balance
		Defn #1	Defn #2			Defn #1	Defn #2	
State Total	60,317	0.237	0.120	35.41	15,954	0.170	0.088	31.88
Non-Metro Counties								
Total	4,094	0.305	0.154	49.55	491	0.377	0.177	40.72
<i>By Allotment Size:</i>								
\$1-100	66	0.303	0.121	16.44	413	0.341	0.140	33.13
\$101-200	481	0.484	0.316	37.99	22	0.364	0.045	3.48
\$201-300	1,363	0.323	0.158	43.91	4	0.250	0.000	382.00
\$301-400	1,298	0.266	0.127	62.03	2	0.500	0.500	22.00
\$401-500	683	0.255	0.107	60.37	1	1.000	1.000	9.00
\$501-600	174	0.201	0.109	39.74	7	0.857	0.571	274.70
\$601+	27	0.000	0.000					
Metro Counties								
Total	26,517	0.334	0.160	35.42	3,262	0.398	0.210	23.19
<i>By Allotment Size</i>								
\$1-100	250	0.340	0.188	16.65	21	0.381	0.143	39.33
\$101-200	2,868	0.556	0.351	34.09	3,047	0.392	0.211	22.77
\$201-300	10,231	0.338	0.152	30.99	165	0.479	0.182	28.97
\$301-400	8,299	0.287	0.130	37.41	11	0.455	0.273	10.51
\$401-500	3,521	0.281	0.108	46.33	8	0.375	0.125	12.02
\$501-600	1,175	0.269	0.118	46.98	7	0.857	0.571	29.93
\$601+	168	0.244	0.161	33.83	2	1.000	0.000	8.00
Baltimore City								
Total	29,695	0.141	0.079	31.17	12,196	0.101	0.052	39.59
<i>By Allotment Size:</i>								
\$1-100	311	0.125	0.055	11.64	23	0.174	0.043	41.47
\$101-200	2,739	0.291	0.189	34.37	11,987	0.099	0.052	39.30
\$201-300	11,261	0.148	0.080	26.11	186	0.220	0.081	47.76
\$301-400	9,374	0.112	0.063	32.64				
\$401-500	4,428	0.111	0.056	35.56				
\$501-600	1,344	0.086	0.055	42.85				
\$601+	226	0.075	0.040	127.87				

Notes: Includes ALL cases with a disbursement in September, including cases with no redemption transactions.

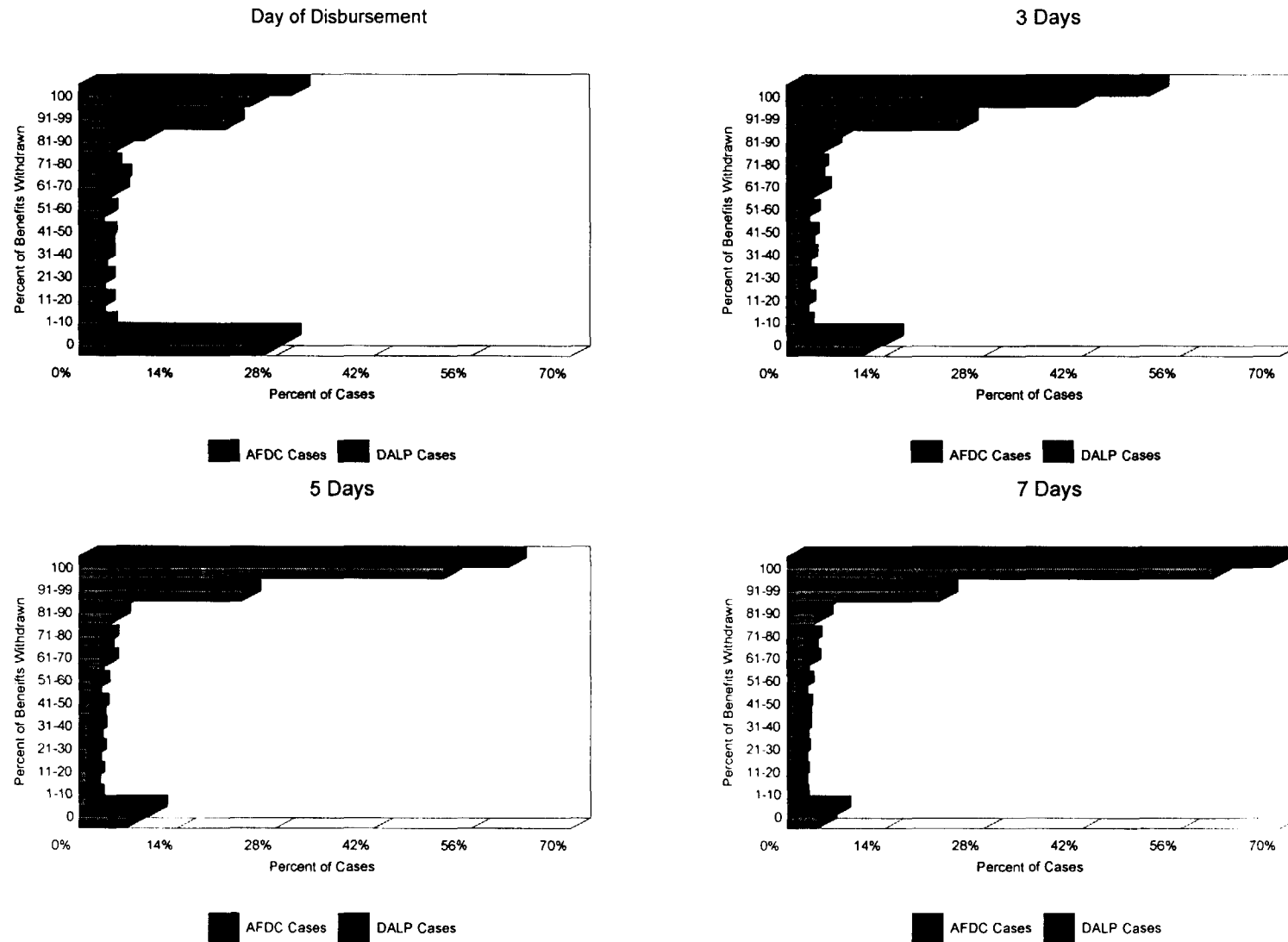
State total exceeds the sum over regions due to cases with missing county code.

Definition #1 = ending balance greater than \$1.

Definition #2 = disbursement for September minus total redemptions in September greater than \$1.

Average end balance is the average balance of food stamp benefits on the day prior to the October disbursement, for cases with greater than \$1 remaining (defn #1).

Figure 3.5
Speed of Cash Benefit Exhaustion By Days Since Disbursement
Percent of Cases According to Percent of Benefits Withdrawn



disbursement 25 percent of AFDC cases have withdrawn their full benefit; an additional 15 percent have withdrawn between 91 and 99 percent of their benefits; and 25 percent of AFDC cases have made no withdrawals. Hence, 65 percent of the caseload have either nearly exhausted their benefits or made no transactions. Looking at the other graphs on this figure we see that benefit withdrawal behavior is characterized by a bimodal distribution: on each day shown, most recipients had either withdrawn at least 91 percent of their benefits or none of their benefits.

The distribution of benefit withdrawal behavior shown in Figure 3.5 can be contrasted with the analogous picture of food stamp benefit redemption shown in Figure 2.8. Food stamp redemption is characterized by a gradual movement of cases from "no benefits redeemed" to "100 percent of benefits redeemed." In other words, on any day during the first week of the disbursement month, a significant number of cases have redeemed a portion of their food stamp allotment without redeeming their full allotment, whereas cash benefits are overwhelmingly redeemed all at once.

Even though most cash benefit recipients withdraw their entire benefit amount all at once (as seen above), the average recipient makes over four withdrawal transactions per month. In Table 3.8 we investigate the extent to which the "number of transactions" may be a misleading measure of transaction behavior.

Table 3.8 examines the incidence of ATM transactions that are "nearly simultaneous"—that is, we counted transactions made by the same recipient and at the same terminal within a five-minute window. It is not hard to imagine how these "five-minute events" might occur. The automated "fast cash" feature of an ATM disburses a specified number of dollars, and recipients might repeat this transaction until the desired cash is in hand. Alternatively, if the ATM menu does not specify the dollar amount desired, multiple transactions may be made (ATM menus typically branch into "fast cash"—i.e., a menu of dollar amounts; or custom cash—an opportunity to specify the dollar amount). In addition, many ATMs have maximum withdrawal amounts that are specific to the ATM owner (i.e., bank) and cannot be centrally overridden (the typical maximums are \$200 or \$300). These withdrawal limits imply that recipients who wish to withdraw their entire allotment must make multiple transactions to do so.

TABLE 3.8
CHARACTERISTICS OF CASH BENEFIT WITHDRAWALS IN THE MARYLAND EBT SYSTEM
 SEPTEMBER 1993

MULTIPLE CASH BENEFIT WITHDRAWALS WITHIN 5-MINUTE WINDOWS

	Total Number of cases	Cases With 5-minute Events		Fraction of cases by number of "events"			Total Number of 5-minute Events	Fraction of "events" by # W/D within 5 minutes				Timing of "events" by Days since disbursement (fraction of events each day)			Fraction of "events" With:	
		Number	Percent	One	Two	Three+		Two	Three	Four	Five+	Day 1	Day 2	Days 3-4	Max W/D =\$200	Max W/D =\$300
Total "Regular" Cases	74,457	27,313	36.7%	0.92	0.07	0.01	29,770	0.73	0.19	0.06	0.02	0.63	0.13	0.08	0.29	0.09
AFDC Cases with "Regular" Monthly Disbursement																
Non-Metro Counties	3,909	1,713	43.8%	0.91	0.08	0.01	1,891	0.72	0.20	0.05	0.03	0.64	0.12	0.09	0.30	0.17
Metro Counties	25,636	7,959	31.0%	0.92	0.07	0.01	8,698	0.78	0.15	0.05	0.03	0.57	0.15	0.10	0.27	0.17
Baltimore City	29,303	13,438	45.9%	0.91	0.08	0.01	14,817	0.67	0.23	0.08	0.03	0.67	0.12	0.08	0.38	0.05
Total AFDC	58,848	23,121	39.3%	0.91	0.08	0.01	25,419	0.71	0.20	0.07	0.03	0.63	0.13	0.09	0.34	0.10
DALP Cases with "Regular" Monthly Disbursement																
Non-Metro Counties	467	122	26.1%	0.98	0.02	0.00	124	0.78	0.19	0.02	0.01	0.58	0.13	0.09	0.03	0.02
Metro Counties	3,167	713	22.5%	0.93	0.07	0.00	765	0.76	0.17	0.04	0.02	0.50	0.12	0.10	0.02	0.01
Baltimore City	11,954	3,356	28.1%	0.97	0.03	0.00	3,461	0.84	0.15	0.01	0.00	0.70	0.12	0.06	0.00	0.00
Total DALP	15,588	4,192	26.9%	0.96	0.04	0.00	4,351	0.83	0.15	0.02	0.01	0.66	0.12	0.07	0.01	0.00

Notes: A "5-minute event" is defined to be any 5-minute window containing more than 1 cash withdrawal transaction made at the same ATM location.
 Regions do not sum to total due to cases with missing county code.

As seen in Table 3.8, 37 percent of cases had at least one "five-minute event" in which they made back-to-back transactions. Most of these recipients did this only once, though 7 percent of these cases did it on two occasions. Three quarters of all "events" involved two transactions within five minutes, and another 19 percent of events involved three transactions within five minutes. This means that the mean number of transactions per case overstates the number of "transaction occasions" per case. If recipients had consolidated the "multiple withdrawals within a five-minute window" into single transactions, the mean number of ATM transactions per case would have been 1.96 rather than the 2.46 shown in Table 3.3.

Out-of-State Transactions

The MOST debit card network is a major ATM network operating throughout the mid-Atlantic region. As noted at the beginning of this chapter, cash assistance recipients in Maryland could access their EBT benefits at any ATM in the MOST network, even those located in other states or the District of Columbia.

In fact, Maryland recipients made only limited use of ATMs outside Maryland. As shown in Table 3.9, 2.2 percent of all recipients used out-of-state ATMs in September.³³ The transactions occurring at the out-of-state ATMs represented 1.5 percent of all EBT transactions at ATMs that month and 1.6 percent of all EBT dollars withdrawn at ATMs. The cross-state activity is largely due to the transactions behavior of recipients in bordering counties, and three counties account for most of the cross-state activity.

Notably, the far right columns of Table 3.9 show that recipients with any out-of-state transactions are not completely dependent on out-of-state processing capabilities. These recipients, on average, make only slightly more than half of their cash ATM transactions across state lines.

33. Table 3.9 is based on all cases receiving cash benefits in September, not just those receiving regular disbursements.

Table 3.9
CASH BENEFIT WITHDRAWALS AT OUT-OF-STATE LOCATIONS

	Full Caseload	Cases with any <u>Out-of-State Withdrawals</u>		<u>Out-of-State ATM Withdrawal Transactions</u>				<u>Avg Fraction Out-of-State per case with any Out-of-State</u>	
		Number	Percent	Number	Percent	\$ Amount	Percent	Transactions	Dollars
All Counties	100,553	2,162	2.2%	7,228	1.5%	460,500	1.6%	0.66	0.73
Non-Bordering Counties	13,087	83	0.6%	255	0.4%	18,480	0.5%	0.68	0.72
Bordering Counties:*									
Total	87,430	2,079	2.4%	6,973	1.6%	442,020	1.7%	0.66	0.73
Montgomery	4,877	309	6.3%	1,108	5.4%	61,225	4.1%	0.62	0.66
Prince George's	11,566	1,488	12.9%	4,940	10.4%	321,490	8.7%	0.63	0.69
Worcester	453	17	3.8%	58	3.0%	5,640	4.1%	0.73	0.84

Non-bordering counties: Anne Arundel, Calvert, Charles, Howard, St. Mary's, Somerset, Talbot, Baltimore City.

Bordering counties: Allegheny (WV,PA), Baltimore (PA), Caroline (DE), Carroll (PA), Cecil (PA,DE), Dorchester (DE), Frederick (PA,VA), Garrett (PA,WV), Harford (PA), Montgomery (DC,VA), Prince George's (DC,VA), Queen Anne's (DE), Washington (PA,WV), Wicomico (DE), Worcester (DE).

* Bordering counties with fewer than 3% of transactions occurring out-of-state are not shown separately.

APPENDIX A
DESCRIPTION OF TRANSACTIONS LOG FILE
AND PROCESSING METHODS

The primary source of data used in this report is the transactions log file of the Maryland EBT system. The transactions log file was provided by the EBT vendor, Deluxe Data Systems, and includes the withdrawal and redemption activity of the entire Maryland caseload of EBT clients (this includes the caseloads of both the FSP and cash benefit programs).³⁴

The file that we received contains almost all of the transactions affecting the accounts of Maryland EBT clients for the period August 1993-October 1993. We used the month of September for this study.³⁵ The file contains one record for every transaction that is processed by the system. There are five types of records: benefit authorizations, cash benefit withdrawals, food stamp benefit redemptions, balance inquiries, and food stamp refunds (store refunds that are added back to the EBT account). The transaction records for the September calendar month are distributed approximately as follows:³⁶

<u>Type of Transaction</u>	<u>Percent of Records</u>
Benefit Authorization	9%
Food Stamp Purchase	54%
Food Stamp Refund	< 1%
Cash Benefit Withdrawal	18%
Benefit Balance Inquiries	19%

34. The Maryland EBT System served the AFDC and DALP programs. In addition, NPA-CS cases in Baltimore City were also part of the EBT System in 1993.

35. The August file was incomplete and hence could not be used (there were no records on the file with a transaction date prior to August 4, and the records of benefit authorization were incomplete). The October file could not be used because analysis of the October disbursement month requires data for the first few days of November. This is because food stamp benefits are disbursed to ongoing cases on the fifth, sixth, and seventh days of each month, thereby making the first week of November part of the October "disbursement month."

36. Records documenting PIN changes and direct deposits to the NPACS accounts were not used in our analysis.

Each transaction record includes the following information: type of transaction, date and time of transaction, amount of transaction, remaining balance, and location of redemption or withdrawal (i.e., store ID and POS terminal ID, or ATM terminal ID). In addition, all records except benefit authorizations include codes to identify system rejections and reversals. A small percent of all records are rejected or reversed by the system. *Rejections* are transactions that are rejected by the system due to insufficient funds, incorrect PIN, or other problems with the account.

Reversals are system generated transactions that reverse a previous incorrect or incomplete transaction (thereby making the previous transaction a "reversed transaction"). Appendix Table A.1 shows the overall incidence of EBT system rejections and reversals by reason for system interruption. The majority of system rejections are due to insufficient funds; the majority of reversals are due to terminal errors. (Appendix Table A.2 presents this information by program, store type, and county.)

Data Processing

We processed the transactions data to obtain a separate food stamp redemption history and cash benefit withdrawal history for each case. We initially processed all of the August-October withdrawal/redemption records to get a complete history for each case over the entire time period. This is because the disbursement months (i.e., time period between disbursements) overlap calendar months, and because we wanted to ensure the accuracy of the starting balance at the time of the September disbursement. Construction of the transaction histories required that we "clean" the data in the following ways:

- (1) *Refunds*: All food stamp "refunds" were removed from the file and an adjustment was made to the relevant "purchase" to reflect the fact that it was subsequently refunded (i.e., given that case A received a refund at retailer X, we determined the most recent purchase made by case A at retailer X prior to the refund, for an amount at least as great as the refund. We then subtracted the refund amount from the purchase amount.) In cases in which the refund was for the full amount of the purchase, both the refund record and the purchase record were removed; hence, our count of redemptions will slightly undercount the number of redemption transactions processed by the system.

(2) **Reversals:** All system reversals and "reversed transactions" were removed from the file. The reversed transaction nearly always occurred immediately prior to the reversal, and was identified as occurring at the same terminal for the identical dollar amount.

(3) **Rejections:** All system rejections were removed from the file.

We checked that this "cleaning" was performed properly by reconciling the transaction history of each case with the records of benefit deposits and the remaining balance on the final transaction.³⁷ We were unable to reconcile the transaction history for approximately two tenths of one percent of all cases (370 food stamp histories and 183 cash benefit histories). These unreconciled cases were mostly due to reversals for which we could not find a matching transaction, or reversals that were posted to the transactions log before the transaction that was to be reversed. We subsequently dropped these cases from the sample.

A final step involved extracting that part of the case history that coincided with the September disbursement month; this was achieved by merging the benefit disbursement information to the withdrawal history. Operationally, we maintained a file of the caseload transaction history for the month of September (with the benefit disbursement date) and a file of the caseload activity for the days in October preceding the October disbursement, thus allowing us to conduct both *calendar month* and *disbursement month* analyses. As discussed in the text, we limit the analyses of redemption patterns to cases with a single "regular" monthly disbursement in both September and October.

37. This process is complicated somewhat by the fact that the remaining balance on each record reflects only the "active pot" of money. The Deluxe accounting process is such that each disbursement is treated as a separate "pot." Even though a client has access to all benefits that have been disbursed to his account, the remaining balance on the Deluxe record reflects only the "active pot"—i.e., the disbursement that is currently being drawn down—and the next pot does not become active until the balance on the current pot falls below \$10. Hence, the "active pot" understates the true account balance whenever a balance of at least \$10 is carried over to the following month.

Appendix Table A.1

EBT System-Rejected Transactions and System Reversals
September 1993 Calendar Month

	Food Stamp Transactions		Cash Benefits Transactions	
	Number	Percent*	Number	Percent*
<i>Number and Rate of Rejections</i>				
Number of rejections and percent of all transactions	113,435	7.25	70,377	14.50
Number and percent of cases with any rejections	68,835	44.23	33,628	33.44
<i>Reason for Rejections:</i>				
Insufficient Funds	62,548	55.14	43,380	61.64
Invalid PIN	37,771	33.30	12,989	18.46
PIN tries exceeded	220	0.19	1,045	1.48
PIN not selected	266	0.23	150	0.21
Expired Card	5,943	5.24	4,887	6.94
Lost/stolen Card	1,390	1.23	1,030	1.46
Cardholder not on file	1,585	1.40	261	0.37
No benefit for request	3,590	3.16	6,594	9.37
Processor Option of Decline	10	0.01	8	0.01
Bad FNS status for merchant	101	0.09	.	0.00
System malfunction	10	0.01	22	0.03
Bad card status	1	0.00	11	0.02
<i>Number and Rate of Reversals</i>				
Number of reversals and percent of all transactions	25,209	1.61	5,423	1.12
Number and percent of cases with any reversals	18,987	12.20	4,389	4.36
<i>Reason for Reversals:</i>				
Acquirer communication error	19	0.08	1,515	27.94
Acquirer terminal error	970	3.85	945	17.43
Switch communication error	.	0.00	6	0.11
Switch terminal error	24,097	95.59	2,922	53.88
Late or unsolicited reply	1	0.00	1	0.02
Void last	15	0.06	.	0.00
Unknown	107	0.42	34	0.63

Notes: * The rates of rejection and reversal are expressed as a percent of all valid transactions in the calendar month. The percent of cases with any rejections/reversals is based on the number of cases with valid transactions in the calendar month.

Supplementary Information

We supplemented the transactions log file with information about the store type and county location of each FSP-authorized retailer in the state of Maryland. We obtained this information from the FCS Minneapolis Computer Service Center. This information was merged to the transactions log file via a crosswalk provided by Deluxe that mapped the Deluxe store ID to the FNS ID.³⁸ For a small number of retailers that did not appear in our FNS file, we assigned county location based on the street address from the Deluxe cross-reference file.³⁹ For these same stores we assigned store type based on the name of the store (if the store had multiple locations and at least one appeared on the FNS file), or by consulting the Maryland Department of Human Resources.

In addition, we identified the county location of ATM terminals based on the location information that appears on the transaction records: the transaction records contain the street

different locations.⁴⁰ Most of the Maryland ATM locations could easily be mapped to a county based on the city designated on the transaction record. A significant number of ATMs are located in cities that overlap county boundaries, however. In these cases, we searched the Census TIGER database to determine county location based on street address. Approximately 40 ATMs could not be mapped to a county because the street address was either incomplete or did not appear in the Census database.

40. The remaining ATMs are located in the District of Columbia and the following bordering and nearby states: Delaware, Pennsylvania, Tennessee, Virginia, and West Virginia.

Appendix Table A.2a
FOOD STAMP REJECTIONS AND REVERSALS, BY STORE TYPE

Store Type		Number of Stores		Number of Purchase Transactions	Number of Other Transactions, By Type:			Rate per thousand Authorized Purchases			Fraction of Rejections for:		
		Total	With Any Trans		Refunds	Reversals	Rejections	Refunds	Reversals	Rejections	Invalid PIN	Insuff Funds	Expired Card
Total		3,272	2,998	1,655,915	2,299	25,251	113,076	1.4	15.2	68.3	0.33	0.55	0.05
Alcoholic Treatment	(AT)	3	3	81	0	3	33	0	37.0	407.4	0.27	0.61	0.12
Non-profit Coop	(BC)	15	11	802	5	22	111	6.2	27.4	138.4	0.05	0.47	0.30
Bread Route	(BR)	6	4	914	0	7	55	0.0	7.7	60.2	0.25	0.64	0.02
Comb. Groc/Bar	(CB)	10	9	2,053	0	16	187	0.0	7.8	91.1	0.36	0.55	0.05
Comb. Groc/Gas	(CG)	42	38	12,904	2	59	487	0.2	4.6	37.7	0.32	0.50	0.06
Comb. Groc/Merchandise	(CM)	40	38	6,018	21	89	649	3.5	14.8	107.8	0.35	0.54	0.05
Other Combination	(CO)	139	135	52,047	54	723	4,783	1.0	13.9	91.9	0.37	0.52	0.06
Comb. Groc/Restaurant	(CR)	59	52	22,363	144	930	3,692	6.4	41.6	165.1	0.38	0.50	0.05
Convenience Store	(CS)	971	890	184,915	428	3,615	19,914	2.3	19.5	107.7	0.33	0.54	0.06
Drug Addict Treatment	(DT)	1	1	9				0.0	0.0	0.0			
Farmers Market	(FM)	12	9	3,614	0	29	188	0.0	8.0	52.0	0.35	0.54	0.04
Group Living Arrangment	(GL)	1	1	10	0	0	3	0.0	0.0	300.0	0.00	1.00	0.00
Small/Medium Grocery	(GS)	802	769	465,615	327	3,549	26,874	0.7	7.6	57.7	0.37	0.52	0.05
Health/Natural Food	(HF)	29	24	852	1	43	414	1.2	50.5	485.9	0.39	0.50	0.06
Homeless Meal Provider	(HP)	1	1	5				0.0	0.0	0.0			
Military Commissary	(MC)	8	8	373	1	19	117	2.7	50.9	313.7	0.34	0.55	0.03
Other Firm	(OF)	60	55	20,134	14	206	1,347	0.7	10.2	66.9	0.38	0.50	0.04
Other Route	(OR)	30	24	2,240	1	19	389	0.4	8.5	173.7	0.06	0.64	0.10
Produce Route	(PR)	7	7	110	0	5	193	0.0	45.5	1754.5	0.17	0.60	0.11
Produce Stand	(PS)	53	41	18,527	47	388	1,991	2.5	20.9	107.5	0.38	0.51	0.04
Specialty Food	(SF)	326	309	135,020	285	2,520	11,539	2.1	18.7	85.5	0.35	0.53	0.06
Supermarket	(SM)	563	545	724,854	949	12,884	39,385	1.3	17.8	54.3	0.30	0.60	0.05
Wholesaler	(WH)	11	10	700	14	75	296	20.0	107.1	422.9	0.29	0.58	0.07
Unknown	UN	83	14	1,755	6	50	429	3.4	28.5	244.4	0.22	0.52	0.04

Source: Transactions Log File from Deluxe Data Systems, September 1993 calendar month. Fifteen stores with missing county code are not reflected in the table.

Appendix Table A.2b
FOOD STAMP REJECTIONS AND REVERSALS, BY COUNTY

County	Number of Stores		Number of Purchase Transactions	Number of Transactions, By Type:			Rate per thousand Authorized Purchases			Fraction of Rejections Due to:		
	Total	With Any Trans		Refunds	Reversals	Rejections	Refunds	Reversals	Rejections	Invalid PIN	Insuff Funds	Expired Card
Total	3,272	2,998	1,655,915	2,299	25,251	113,076	1.4	15.2	68.3	0.15	0.28	0.03
County:												
Allegany	93	84	37,381	37	268	1,499	1.0	7.2	40.1	0.33	0.58	0.04
Anne Arundel	176	170	60,830	108	1,351	5,090	1.8	22.2	83.7	0.28	0.59	0.06
Baltimore	307	287	121,011	327	4,085	13,458	2.7	33.8	111.2	0.32	0.56	0.05
Calvert	36	34	6,589	2	107	575	0.3	16.2	87.3	0.27	0.59	0.05
Caroline	34	31	5,836	32	277	1,159	5.5	47.5	198.6	0.26	0.63	0.06
Carroll	65	57	8,800	19	314	1,093	2.2	35.7	124.2	0.23	0.64	0.05
Cecil	50	44	13,533	23	524	2,006	1.7	38.7	148.2	0.30	0.58	0.05
Charles	56	52	18,850	18	386	1,292	1.0	20.5	68.5	0.30	0.59	0.04
Dorchester	30	27	10,292	3	48	485	0.3	4.7	47.1	0.33	0.50	0.07
Frederick	56	53	16,910	21	201	1,191	1.2	11.9	70.4	0.30	0.58	0.04
Garrett	34	27	8,471	9	45	294	1.1	5.3	34.7	0.35	0.55	0.03
Harford	87	84	23,421	48	489	1,703	2.0	20.9	72.7	0.25	0.63	0.04
Howard	49	45	10,493	4	216	793	0.4	20.6	75.6	0.30	0.61	0.05
Kent	14	13	3,502	1	7	101	0.3	2.0	28.8	0.31	0.52	0.06
Montgomery	215	188	59,612	99	1,932	7,351	1.7	32.4	123.3	0.32	0.58	0.05
Prince George's	331	299	126,631	139	2,459	10,882	1.1	19.4	85.9	0.30	0.57	0.06
Queen Anne's	18	17	2,935	1	23	295	0.3	7.8	100.5	0.28	0.61	0.05
St Mary's	54	50	15,829	7	289	986	0.4	18.3	62.3	0.29	0.59	0.06
Somerset	32	31	8,462	7	253	792	0.8	29.9	93.6	0.35	0.54	0.06
Talbot	16	16	5,122	4	40	324	0.8	7.8	63.3	0.38	0.52	0.04
Washington	96	92	29,143	51	248	1,565	1.7	8.5	53.7	0.35	0.55	0.05
Wicomico	72	67	24,204	26	218	1,859	1.1	9.0	76.8	0.32	0.57	0.06
Worcester	36	34	8,605	2	116	734	0.2	13.5	85.3	0.34	0.52	0.06
Baltimore City	1,306	1,179	1,028,779	1,303	11,317	57,322	1.3	11.0	55.7	0.36	0.53	0.05

Source: Transactions Log file from Deluxe Data Systems, September 1993 calendar month. Fifteen counties with missing county code are not reflected in the table.

Appendix Table A.2c
CASH-BENEFIT REJECTIONS & REVERSALS, BY STORE TYPE

Store Type	Number of Stores			Number of:		Rate per thousand		Fraction of Rejections Due to:			
	Total Stores	With Any Cash Trans	Number of Withdrawals	Reversals	Rejections	Cash benefit transactions Reversals	Rejections	Invalid PIN	Insuff Funds	Expired Card	No Benefit
Total	3,302	3,017	226,718	3,065	23,538	14	104	0.22	0.59	0.05	0.12
Alcoholic Treatment (AT)	3	3	70	0	24	0	343	0.21	0.50	0.00	0.29
Non-profit Coop (BC)	15	11	25	0	18	0	720	0.00	0.44	0.22	0.33
Bread Route (BR)	6	4	18	1	3	56	167	0.67	0.33	0.00	0.00
Comb. Groc/Bar (CB)	10	9	618	7	45	11	73	0.18	0.64	0.02	0.09
Comb. Groc/Gas (CG)	42	38	1737	9	138	5	79	0.17	0.62	0.00	0.18
Comb. Groc/Merchandise (CM)	40	38	966	15	128	16	133	0.13	0.63	0.05	0.14
Other Combination (CO)	139	135	11427	107	1476	9	129	0.22	0.59	0.04	0.12
Comb. Groc/Restaurant (CR)	59	52	3420	131	1105	38	323	0.27	0.57	0.05	0.09
Convenience Store (CS)	971	891	20899	313	3772	15	180	0.19	0.59	0.05	0.14
Drug Addict Treatment (DT)	1	1	9	3	3	333	333	0.67	0.33	0.00	0.00
Farmers Market (FM)	12	9	74	3	58	41	784	0.21	0.57	0.07	0.12
Group Living Arrangement (GL)	1	1	6	0	1	0	167	0.00	1.00	0.00	0.00
Small/Medium Grocery (GS)	802	770	69104	572	7642	8	111	0.21	0.60	0.05	0.13
Health/Natural Food (HF)	29	24	10	0	27	0	2700	0.22	0.48	0.04	0.22
Military Commissary (MC)	8	8	2	1	15	500	7500	0.00	0.73	0.00	0.27
Other Firm (OF)	60	55	1632	26	305	16	187	0.21	0.62	0.03	0.11
Other Route (OR)	30	24	79	1	12	13	152	0.25	0.50	0.25	0.00
Produce Stand (PS)	53	41	477	19	314	40	658	0.19	0.59	0.03	0.16
Specialty Food (SF)	326	309	4968	247	1767	50	356	0.22	0.58	0.05	0.12
Supermarket (SM)	563	545	105982	1581	6148	15	58	0.25	0.57	0.06	0.09
Wholesaler (VH)	11	10	7	0	2	0	286	0.00	0.00	0.50	0.00
Non-Food Merchant	45	31	4805	26	447	5	93	0.29	0.50	0.09	0.09
Unknown UN	76	8	383	3	88	8	230	0.15	0.63	0.07	0.14

Source: Transactions Log File from Deluxe Data Systems, September 1993 calendar month. Fifteen stores with missing county code are not reflected in the table.

Note. The 3,302 stores include 3,272 FSP-authorized retailers plus 45 non-food merchants with POS terminals for cash benefit withdrawals.

Appendix Table A.2d
CASH-BENEFIT REJECTIONS & REVERSALS, BY COUNTY

County	Number of Stores			Number of:		Rate per thousand		Fraction of Rejections Due to:			
	Total	With Any Cash Trans	Number of Withdrawals	Reversals	Rejections	Cash benefit transactions Reversals	Rejections	Invalid PIN	Insuff Funds	Expired Card	No Benefit
Total	3,302	3,016	226,689	3,062	23,511	14	104	22.07	58.68	5.02	11.79
Allegany	95	85	2446	21	185	9	76	16.76	52.97	5.95	24.32
Anne Arundel	177	171	6604	124	600	19	91	21.50	58.00	4.17	13.17
Baltimore	311	288	14735	453	2415	31	164	25.01	59.09	4.84	8.65
Calvert	36	34	660	12	70	18	106	17.14	48.57	2.86	30.00
Caroline	34	31	706	24	90	34	127	20.00	55.56	7.78	12.22
Carroll	67	57	716	26	159	36	222	27.04	52.83	2.52	10.69
Cecil	50	44	1549	63	472	41	305	20.34	58.26	5.08	11.86
Charles	58	52	1728	23	215	13	124	17.21	58.14	2.79	19.53
Dorchester	30	27	1169	4	102	3	87	20.59	59.80	2.94	14.71
Frederick	56	53	1579	20	157	13	99	20.38	56.05	5.10	12.74
Garrett	35	27	464	5	39	11	84	25.64	43.59	5.13	20.51
Harford	88	85	2645	35	240	13	91	23.75	47.92	5.42	21.25
Howard	49	45	1182	26	76	22	64	13.16	59.21	2.63	23.68
Kent	14	13	355	0	18	0	51	22.22	33.33	0.00	38.89
Montgomery	217	188	5531	199	983	36	178	21.67	60.22	6.31	9.26
Prince George's	332	299	15169	318	1795	21	118	21.28	58.27	5.52	12.26
Queen Anne's	19	17	314	2	25	6	80	8.00	76.00	4.00	12.00
St Mary's	54	50	1606	34	83	21	52	18.07	56.63	2.41	22.89
Somerset	33	32	1262	16	120	13	95	18.33	60.00	4.17	17.50
Talbot	16	16	411	16	78	39	190	29.49	51.28	6.41	12.82
Washington	97	93	2415	17	150	7	62	20.00	60.67	2.00	14.00
Wicomico	73	67	2598	27	296	10	114	19.93	54.73	3.04	20.61
Worcester	36	34	1014	9	90	9	89	18.89	51.11	8.89	20.00
Baltimore City	1325	1208	159831	1588	15053	10	94	22.07	59.18	5.06	11.35

Source: Transactions Log File from Deluxe Data Systems, September 1993 calendar month. Fifteen stores with missing county code are not reflected in the table.

Note: The 3,302 stores include 3,272 FSP-authorized retailers plus 45 non-food merchants with POS terminals for cash benefit withdrawals.

APPENDIX B

COMPARISON OF SURVEY RESPONSES WITH TRANSACTIONS BEHAVIOR

The evaluation of the Expanded EBT Demonstration in Maryland included a survey of a sample of EBT recipient households. The sample included approximately 1,200 food stamp households that were interviewed after implementation of EBT. (The survey methods and content of the instrument are documented in Kirlin *et al.*, 1994). The survey dataset from the Maryland evaluation provides a rare opportunity to match records of *reported* behavior to a database containing records of *actual* behavior.

This appendix presents the results of the comparison of reported and actual food stamp redemption behavior for the respondents of the Maryland Recipient Survey. Unfortunately, although the survey interviews were conducted over a period of several months, our actual transactions records are for September 1993. Reported transactions behavior, therefore, cannot be expected to correlate perfectly with the actual transactions record even in the absence of reporting error. For this reason, we focus the analysis on a selection of survey items that ask about general behavior or behavior in a "typical month," rather than questions that specifically ask about "last month." For example, survey respondents were asked "Do you *ever* save any of your food stamp benefits in a particular month so that you can use them in a later month?" and "In which type of store do you spend most of your food stamp benefits in a *typical* month?"

Tables B.1—B.3 show the results of this analysis. Each table presents the survey questions on the right side of the table with the possible survey responses forming the column headings. The frequency of survey responses is shown in brackets in each column. Respondents are "grouped" according to their response to the survey item and the distribution of actual transaction behavior is examined for each "group." In other words, we examine the actual transactions behavior of survey respondents, according to their reported behavior.

Actual and reported measures of benefit exhaustion are compared in Table B.1. Survey respondents were asked "One week after you receive your food stamp benefits, do you usually

have ... (none/less than half/about half/more than half) remaining?" We examined the average fraction of benefits remaining seven days following disbursement for each of the groups of respondents (grouped according to their response to the survey). We also present the quartiles of the distribution for each group. As seen in the table, there is very little difference in the actual fraction of benefits remaining after seven days for groups that reported very different behavior. The group that reported "none" remaining and the group that reported "more than half" actually differ by only 10 percentage points at the mean.

The bottom panel of Table B.1 compares "saving" behavior. Respondents were asked if they ever save benefits from one month to the next (i.e., do ever they fail to exhaust their benefits?). The transactions log provides us with two points of observation for this "saving" behavior. First, we look at whether respondents started the September 1993 disbursement month with a balance remaining from a previous month; this provides a long-run view because this excess may have been carried over in *any* month prior to September. Second, we look at whether respondents ended the September disbursement month with any benefits remaining; this measure detects the saving behavior in the September disbursement month only. The table shows that reported "savers" were in fact more likely to display saving behavior, in both the September month and prior to the September month. As expected, the differential between savers and non-savers is greater according to the long run measure. According to our most restrictive measure of "saving behavior" (defined by a \$5 carryover), the reported savers were twice as likely to have actually saved than the nonsavers.

Tables B.2 and B.3 examine shopping behavior: the type of store where most benefits are spent, the number of stores usually frequented, and the number of shopping trips made in a typical month. There is almost no variation in the reported "type of store where most benefits are spent," as 95 percent of survey respondents reported spending most of their benefits at supermarkets. A slightly smaller percent (80 percent) of all respondents *actually* redeemed most of their benefits at supermarkets in the month of September. Even among those who reported spending most at small grocery stores, 80 percent actually spent most at supermarkets.⁴¹ A

41. Of course, it is not obvious that the reporting error stems from mis-characterization of behavior or from misperception of store type.

comparison of the upper and lower portions of Table B.2, however, shows that there is some inconsistency in reported behavior between different survey items. When we examine respondents reported dollar amounts spent at each store type in the last seven days, there is greater consistency between reported and actual behavior. There is still a considerable amount of apparent noise in the survey responses, however.

The reported "number of different stores frequented" and "number of shopping trips" are compared to actual behavior in Table B.3. Again, there is an obvious lack of correlation between survey responses and actual behavior within each column. For example, among those who report using their EBT card in a single store, one third actually did redeem benefits at a single store in the month of September; another one third of this group shopped at three to five stores; and the final third was almost evenly divided between two stores and more than five stores. Those reporting only one store, however, were far more likely to shop at only one store than those reporting a greater number of stores. This same pattern emerges in the bottom panel of the table: we do not see a high degree of correlation between reported and actual behavior *within* groups defined by survey response, but there is a difference in the relative distributions of actual behavior across survey responses.

It is difficult to draw conclusions from this exercise, because the transactions log and the survey interviews do not reference the same time period. The data, however, seem to shed some uncertainty on the validity of responses to survey questions of this type.

Appendix Table B.1
Correspondence Between Survey Response and Actual Transactions Behavior
Benefit Exhaustion

Measure of Actual Transactions Behavior	Survey Question			
	<i>Q: "One week after you receive your Food Stamp Benefits do you usually have?"</i>			
	None	Less than 1/2	About 1/2	More than 1/2
<u>Fraction of Benefits Remaining on Day 7</u>	[248]	[332]	[209]	[115]
Mean	0.28	0.26	0.31	0.39
25th percentile	0.00	0.02	0.06	0.10
Median	0.12	0.16	0.21	0.40
75th percentile	0.48	0.46	0.53	0.61
	<i>Q: "Do you ever save any of your Food Stamp benefits in a particular month so that you can use them in a later month?"</i>			
	Yes	No	Don't Know	
	[190]	[736]	[7]	
<u>Fraction of cases starting the month with:</u>				
Any benefits carried over	0.67	0.57		
More than \$1 carried over	0.32	0.20		
More than \$5 carried over	0.16	0.08		
<u>Fraction of cases redeeming less than current month's disbursement:</u>				
Any benefits left over	0.41	0.40		
More than \$1 left over	0.19	0.14		
More than \$5 left over	0.11	0.06		

Notes: Actual transactions information comes from September 1993. This month does not necessarily correspond to the interview month. Number of households reporting survey response in brackets. All percents are column percents.

Appendix Table B.2
Correspondence Between Survey Response and Actual Transactions Behavior
Store Types Frequented

Measure of Actual Transactions Behavior	Survey Question			
	<i>Q: "In which type of store do you spend most of your Food Stamp benefits in a typical month?"</i>			
	Supermarkets	Grocery Stores	Convenience Stores	Other Stores
Fraction of cases spending majority of benefits at:	[877]	[33]	[4]	[10]
Supermarkets	0.81	0.79	0.25	0.70
Grocery Stores	0.10	0.06	0.25	0.20
Convenience Stores	0.02	0.03	0.25	0.00
Other Stores	0.07	0.12	0.25	0.10
	<i>Store type at which majority of spending occurred according to: Q: "During the last 7 days, about how much did your household spend at (supermarkets, small grocers, convenience stores, other)?"*</i>			
	Supermarkets	Grocery Stores	Convenience Stores	Other Stores
Fraction of cases spending majority of benefits at:	[629]	[85]	[212]	[7]
Supermarkets	0.84	0.67	0.78	0.71
Grocery Stores	0.09	0.16	0.10	0.14
Convenience Stores	0.01	0.07	0.02	0.00
Other Stores	0.06	0.09	0.10	0.14

Notes: Actual transactions information comes from September 1993. This month does not necessarily correspond to the interview month. Number of households reporting survey response in brackets. All percents are column percents.

* The survey instrument asked for the "total amount spent" at each store type and the amount spent on nonfood items. The "majority of spending" is based on the total amount less the nonfood amount.

Appendix Table B.3
Correspondence Between Survey Response and Actual Transactions Behavior
Number of Stores Frequented and Number of Shopping Trips

Measure of Actual Transactions Behavior	Survey Question				
	<i>Q: "In how many different stores do you use your (EBT) card for grocery shopping in a typical month?"</i>				
Number of different stores in which card was actually used in September 1993:	1	2	3-5	5+	
	[274]	[339]	[287]	[24]	
Fraction of cases reporting:					
One store	0.33	0.12	0.07	0.04	
Two stores	0.16	0.18	0.12	0.04	
Three to five stores	0.33	0.44	0.43	0.13	
More than five stores	0.12	0.23	0.35	0.75	
No transactions in 9/93	0.06	0.04	0.04	0.00	
	<i>Q: "In a typical month, how many times do you or does someone else use your (EBT) card for food shopping?"</i>				
Number of Food Stamp transactions in September 1993 transactions log:	1	2	3-5	6-10	11+
	[140]	[188]	[379]	[150]	[64]
One redemption	0.31	0.06	0.02	0.01	0.00
Two	0.14	0.12	0.04	0.05	0.00
Three - Five	0.17	0.21	0.20	0.14	0.06
Six - Ten	0.16	0.28	0.03	0.25	0.30
More than Ten	0.18	0.32	0.40	0.56	0.64
No transactions in 9/93	0.04	0.02	0.02	0.00	0.00

Notes: Actual transactions information comes from September 1993. This month does not necessarily correspond to the interview month. Number of households reporting survey response in brackets.

All percents are column percents.

APPENDIX C
STUDIES OF BENEFIT REDEMPTION

Appendix Table C
STUDIES OF BENEFIT REDEMPTION

Study	Food Stamp Recipients' Patterns of Benefit Redemption. Abt Associates Inc., 1987	Evaluation of the Off-Line Electronic Benefits Transfer Demonstration. (Draft) Phoenix Planning & Evaluation Ltd, Nov 4, 1993	Patterns of Food Stamp and Cash Welfare Benefit Redemption. Abt Associates Inc., 1995
Study Site	Reading, Pennsylvania February-November 1985	Montgomery County, Ohio May 1992	State of Maryland September 1993
Data	1) On-line EBT transactions data 2) Survey of demonstration households	1) Off-line EBT transactions data 2) Client acct data (Ohio DHS) 3) MapInfo—Geo mapping software	1) On-line EBT transactions data 2) Survey of demonstration households
Sample sizes	1) 5,541 households using EBT during Feb-Nov 1985 (avg of 3,000 per month) 2) 10% random sample of purchase transactions during the period (24,206 transactions) 3) survey sample of 402 households	10,143 households (FSP pop)	1) 159,054 households (FSP pop) 2) 104,180 cash benefit recipients (welfare population of Maryland) 3) survey sample of 933 food stamp households
Available demographics	Survey information: - household composition - public assistance receipt - age, race, sex, educ, and employment status of household head	Client account info: - household composition - earned & unearned income - age, race, sex, marital status - vehicle ownership	Survey information: - household composition - public assistance receipt - age, race, sex, educ, and employment status of household head

APPENDIX D
CASH BENEFIT REDEMPTION TABLES, BY COUNTY

The following tables are analogous to those appearing in Chapter Three, with statistics shown at the county level.

Appendix Table D.1a
CASH BENEFIT REDEMPTION IN MARYLAND
SEPTEMBER 1993
AFDC Cases with "Regular" Monthly Disbursement

	Caseload	Total Issuances	Average Benefits	Total Withdrawal Transactions	Average Withdrawal Amount	Avg # Transactions		Aggregate fraction of benefits redeemed by:			
						per case	per \$100 allot.	Day 1	Day 2	Day 3	Day 7
County:											
Allegany	977	324,879	332.53	3,696	130.98	3.78	1.21	0.67	0.77	0.81	0.90
Anne Arundel	2,599	839,687	323.08	11,811	102.46	4.54	1.48	0.56	0.70	0.77	0.89
Baltimore	5,313	1,710,451	321.94	23,936	108.27	4.51	1.47	0.53	0.68	0.75	0.88
Calvert	336	113,918	339.04	1,679	92.95	5.00	1.50	0.54	0.65	0.72	0.84
Caroline	264	83,997	318.17	1,255	82.51	4.75	1.61	0.57	0.69	0.74	0.85
Carroll	425	135,990	319.98	1,769	116.28	4.16	1.36	0.53	0.65	0.70	0.84
Cecil	648	217,825	336.15	2,419	125.84	3.73	1.16	0.36	0.57	0.74	0.89
Charles	921	318,026	345.31	4,195	101.93	4.55	1.40	0.60	0.73	0.78	0.89
Dorchester	429	131,308	306.08	2,121	85.69	4.94	1.71	0.65	0.76	0.81	0.89
Frederick	731	234,583	320.91	2,983	116.66	4.08	1.33	0.56	0.70	0.75	0.88
Garrett	189	61,766	326.80	669	143.96	3.54	1.17	0.67	0.78	0.81	0.89
Harford	1,018	321,422	315.74	4,725	93.99	4.64	1.54	0.54	0.68	0.75	0.87
Howard	564	178,982	317.34	2,803	94.80	4.97	1.63	0.52	0.66	0.71	0.87
Kent	90	29,465	327.38	423	99.30	4.70	1.45	0.65	0.79	0.83	0.90
Montgomery	3,206	1,040,410	324.52	13,846	110.14	4.32	1.40	0.52	0.68	0.75	0.89
Prince George's	8,341	2,680,767	321.40	33,908	119.09	4.07	1.34	0.53	0.68	0.76	0.90
Queen Anne's	157	50,194	319.71	722	95.08	4.60	1.50	0.50	0.65	0.70	0.82
St Mary's	641	213,623	333.27	3,112	94.29	4.85	1.53	0.56	0.69	0.76	0.89
Somerset	313	102,180	326.45	1,643	88.41	5.25	1.70	0.66	0.77	0.81	0.88
Talbot	215	64,566	300.31	1,044	83.58	4.86	1.73	0.56	0.69	0.73	0.85
Washington	1,048	331,964	316.76	4,413	117.50	4.21	1.46	0.66	0.76	0.80	0.88
Wicomico	827	264,776	320.16	4,319	77.88	5.22	1.77	0.63	0.74	0.80	0.90
Worcester	293	94,558	322.73	1,257	106.75	4.29	1.52	0.59	0.71	0.77	0.87
Baltimore City	29,303	9,537,587	325.48	158,164	103.80	5.40	1.78	0.66	0.78	0.83	0.93

Notes: Tables exclude 21 cases with missing county code.

The average number of transactions per \$100 allotment is calculated first per case and then averaged over cases

Number of "withdrawal" transactions include POS transactions that may be purchase only, purchase and cash-back, or cash-back only transactions.

Appendix Table D.1b
CASH BENEFIT REDEMPTION IN MARYLAND
 SEPTEMBER 1993
 DALP Cases with "Regular" Monthly Disbursement

	Caseload	Total Issuances	Average Benefits	Total Withdrawal Transactions	Average Withdrawal Amount	Avg # Transactions		Aggregate fraction of benefits redeemed by:			
						per case	per \$100 allot.	Day 1	Day 2	Day 3	Day 7
County:											
Allegany	163	25,463	156.22	473	76.44	2.90	1.87	0.62	0.73	0.78	0.90
Anne Arundel	433	69,545	160.61	1,357	76.83	3.13	2.00	0.50	0.64	0.72	0.86
Baltimore	693	132,502	191.20	2,414	90.98	3.48	1.83	0.52	0.65	0.73	0.88
Calvert	60	9,628	160.47	179	72.51	2.98	1.86	0.38	0.57	0.68	0.86
Caroline	12	1,880	156.67	46	66.58	3.83	2.44	0.54	0.69	0.79	0.85
Carroll	21	3,270	155.71	73	70.09	3.48	2.21	0.25	0.38	0.49	0.70
Cecil	84	14,172	168.71	234	94.06	2.79	1.64	0.35	0.48	0.66	0.86
Charles	140	22,127	158.05	390	79.64	2.79	1.77	0.50	0.63	0.68	0.90
Dorchester	56	8,213	146.66	168	73.57	3.00	2.03	0.59	0.71	0.85	0.98
Frederick	113	18,147	160.59	337	81.67	2.98	1.89	0.49	0.66	0.74	0.84
Garrett	37	6,406	173.14	109	88.43	2.95	1.82	0.49	0.74	0.79	0.88
Harford	117	18,733	160.11	383	75.77	3.27	2.06	0.48	0.64	0.73	0.89
Howard	65	10,346	159.17	246	69.39	3.78	2.38	0.36	0.46	0.54	0.80
Kent	15	2,221	148.09	33	84.22	2.20	2.03	0.37	0.37	0.39	0.52
Montgomery	564	93,507	165.79	1,723	85.84	3.05	1.93	0.34	0.48	0.55	0.79
Prince George's	658	107,927	164.02	1,939	85.13	2.95	1.82	0.40	0.57	0.67	0.86
Queen Anne's	31	6,870	221.61	103	90.02	3.32	1.87	0.39	0.50	0.69	0.88
St Mary's	89	14,002	157.33	290	75.51	3.26	2.09	0.41	0.58	0.65	0.80
Somerset	25	4,029	161.16	71	76.84	2.84	1.78	0.59	0.73	0.77	0.97
Talbot	31	4,806	155.03	94	65.56	3.03	1.96	0.45	0.63	0.68	0.82
Washington	109	17,685	162.25	339	75.94	3.11	1.97	0.60	0.71	0.82	0.91
Wicomico	89	15,462	173.73	284	65.74	3.19	2.06	0.53	0.61	0.68	0.81
Worcester	29	4,553	157.00	85	84.45	2.93	1.87	0.44	0.63	0.67	0.88
Baltimore City	11,954	1,883,734	157.58	47,959	70.19	4.01	2.55	0.68	0.81	0.85	0.95

Notes: Tables exclude 21 cases with missing county code.

The average number of transactions per \$100 allotment is calculated first per case and then averaged over cases.

Number of "withdrawal" transactions include POS transactions that may be purchase only, purchase and cash-back, or cash-back only transactions

Appendix Table D.2a
CASH BENEFIT REDEMPTIONS BY LOCATION
SEPTEMBER 1993
AFDC Cases with "Regular" Monthly Disbursement

	<u>Withdrawal Locations*</u>		<u>Fraction of All Transactions at:</u>		<u>Fraction of Amount Withdrawn from:</u>		<u>Avg Number of Transactions at:</u>		<u>Fraction of cases exclusively using:</u>		<u>Average Withdrawal Amount</u>	
	Number	Fraction ATM	ATM	POS	ATM	POS	ATM	POS	ATM	POS	ATM	POS
County:												
Allegany	95	0.18	0.59	0.41	0.88	0.12	2.22	1.57	0.27	0.09	183.73	33.27
Anne Arundel	332	0.47	0.69	0.31	0.86	0.14	3.12	1.43	0.27	0.08	124.88	39.77
Baltimore	450	0.32	0.64	0.36	0.76	0.24	2.88	1.63	0.22	0.16	114.92	61.92
Calvert	52	0.33	0.73	0.27	0.90	0.10	3.63	1.37	0.32	0.04	118.65	23.54
Caroline	38	0.11	0.65	0.35	0.87	0.13	3.09	1.66	0.25	0.08	107.25	25.72
Carroll	101	0.34	0.71	0.29	0.87	0.13	2.95	1.21	0.40	0.07	141.18	38.53
Cecil	53	0.06	0.53	0.47	0.72	0.28	1.96	1.77	0.17	0.21	163.85	62.80
Charles	92	0.37	0.71	0.29	0.93	0.07	3.24	1.31	0.29	0.02	134.31	20.21
Dorchester	37	0.19	0.63	0.37	0.90	0.10	3.09	1.85	0.26	0.06	116.41	21.88
Frederick	111	0.50	0.67	0.33	0.83	0.17	2.72	1.36	0.33	0.09	147.70	42.97
Garrett	38	0.08	0.58	0.42	0.84	0.16	2.07	1.47	0.34	0.13	196.59	46.41
Harford	138	0.36	0.64	0.36	0.86	0.14	2.97	1.67	0.26	0.07	123.59	28.98
Howard	118	0.58	0.71	0.29	0.89	0.11	3.53	1.44	0.29	0.07	119.76	27.87
Kent	17	0.18	0.60	0.40	0.84	0.16	2.83	1.87	0.18	0.08	128.49	36.11
Montgomery	630	0.66	0.70	0.30	0.90	0.10	3.03	1.29	0.31	0.04	144.00	24.64
Prince George's	595	0.44	0.69	0.31	0.85	0.15	2.79	1.28	0.31	0.10	146.98	45.59
Queen Anne's	26	0.27	0.70	0.30	0.90	0.10	3.22	1.38	0.35	0.04	118.31	22.51
St Mary's	70	0.23	0.69	0.31	0.91	0.09	3.37	1.49	0.30	0.05	123.47	23.04
Somerset	34	0.03	0.44	0.56	0.86	0.14	2.31	2.94	0.13	0.06	156.18	13.39
Talbot	26	0.38	0.76	0.24	0.87	0.13	3.68	1.18	0.29	0.07	88.80	36.24
Washington	141	0.31	0.65	0.35	0.90	0.10	2.74	1.47	0.35	0.06	157.07	27.17
Wicomico	91	0.20	0.65	0.35	0.93	0.07	3.40	1.82	0.21	0.02	108.70	12.52

Worcester	55	0.35	0.51	0.49	0.71	0.29	2.19	2.10	0.18	0.22	135.78	55.17
Baltimore City	1660	0.20	0.45	0.55	0.67	0.33	2.45	2.95	0.08	0.24	111.98	66.69

Appendix Table D.2b
CASH BENEFIT REDEMPTIONS BY LOCATION
 SEPTEMBER 1993
 DALP Cases with "Regular" Monthly Disbursement

	<u>Withdrawal Locations*</u>		<u>Fraction of All Transactions at:</u>		<u>Fraction of Amount Withdrawn from:</u>		<u>Avg Number of Transactions at:</u>		<u>Fraction of cases exclusively using:</u>		<u>Average Withdrawal Amount</u>	
	Number	Percent ATM	ATM	POS	ATM	POS	ATM	POS	ATM	POS	ATM	POS
County:												
Allegany	95	0.18	0.53	0.47	0.77	0.23	1.53	1.37	0.22	0.17	108.07	31.07
Anne Arundel	332	0.47	0.62	0.38	0.78	0.22	1.93	1.21	0.30	0.17	89.72	38.64
Baltimore	450	0.32	0.64	0.36	0.75	0.25	2.22	1.26	0.30	0.19	95.08	53.45
Calvert	52	0.33	0.63	0.37	0.77	0.23	1.87	1.12	0.37	0.17	87.45	40.67
Caroline	38	0.11	0.63	0.37	0.72	0.28	2.42	1.42	0.33	0.25	69.26	42.31
Carroll	101	0.34	0.64	0.36	0.75	0.25	2.24	1.24	0.38	0.19	78.40	46.48
Cecil	53	0.06	0.48	0.52	0.57	0.43	1.33	1.45	0.17	0.36	101.24	70.11
Charles	92	0.37	0.65	0.35	0.80	0.20	1.81	0.98	0.35	0.15	94.69	38.92
Dorchester	37	0.19	0.60	0.40	0.78	0.22	1.79	1.21	0.32	0.16	84.77	39.22
Frederick	111	0.50	0.58	0.42	0.72	0.28	1.73	1.25	0.33	0.25	93.24	49.05
Garrett	38	0.08	0.59	0.41	0.72	0.28	1.73	1.22	0.27	0.24	114.71	42.20
Harford	138	0.36	0.54	0.46	0.75	0.25	1.77	1.50	0.21	0.18	91.43	37.11
Howard	118	0.58	0.62	0.38	0.76	0.24	2.35	1.43	0.32	0.14	78.65	38.82
Kent	17	0.18	0.70	0.30	0.78	0.22	1.53	0.67	0.40	0.13	89.49	41.57
Montgomery	630	0.66	0.67	0.33	0.86	0.14	2.05	1.00	0.43	0.09	104.62	26.24
Prince George's	595	0.44	0.64	0.36	0.80	0.20	1.88	1.06	0.34	0.16	103.48	37.61
Queen Anne's	26	0.27	0.69	0.31	0.93	0.07	2.29	1.03	0.45	0.03	104.62	21.86
St Mary's	70	0.23	0.62	0.38	0.83	0.17	2.02	1.24	0.36	0.10	94.08	30.50
Somerset	34	0.03	0.45	0.55	0.81	0.19	1.28	1.56	0.12	0.12	124.46	22.93
Talbot	26	0.38	0.81	0.19	0.89	0.11	2.45	0.58	0.55	0.10	68.45	29.51
Washington	141	0.31	0.63	0.37	0.88	0.12	1.94	1.17	0.39	0.08	110.48	20.43
Wicomico	91	0.20	0.67	0.33	0.90	0.10	2.12	1.07	0.31	0.02	82.54	20.22
Worcester	55	0.35	0.47	0.53	0.58	0.42	1.38	1.55	0.17	0.34	96.53	59.45
Baltimore City	1660	0.20	0.39	0.61	0.56	0.44	1.56	2.46	0.05	0.35	72.62	52.45

* Total number of withdrawal locations include ATM locations and POS locations. Note that we count locations and not terminals.
 Withdrawals include POS transactions that may be purchase only, purchase and cash-back, or cash-back only transactions.